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EFFECT ON THE EYE OF RADIUM USED FOR TREATMENT OF MALIGNANT DISEASE IN THE NEIGHBOURHOOD*

BY

PHILIPPA MARTIN, M.S., F.R.C.S.

Ophthalmic Surgeon, Hospital for Epilepsy and Paralysis, Maida Vale; Assistant Surgeon, Western Ophthalmic Hospital

At University College Hospital in 1931 it became clear that profound changes could be caused in the eye by radium used for the treatment of malignant tumours in its neighbourhood. I therefore began an inquiry into the effects of radium on the eye among cases treated by the surgical staff of the hospital, to whom I am indebted for constant encouragement and support.

The tumours treated included basal-cell carcinoma, lupus carcinoma and epithelioma of the skin, meningioma and carcinoma and sarcoma occurring in the upper jaw. Several of the cases had refused or were beyond the scope of operation.

For the first two years treatment was by interstitial or surface irradiation with needles of low linear intensity, but since 1933 a 1-gramme radium unit has been available. Needles with a 0.5 millimetre platinum screen were used at the beginning, but the experience gained in the first six months led to the substitution of these so far as possible by needles with a screen of 0.8 millimetre platinum for all cases in which it was necessary to introduce radium into the orbit.

I have included the late results of a few cases treated ten years ago with radium needles of high linear intensity and light screenage.

Conjunctival Reaction: Early Effects

When malignant disease in the neighbourhood of the eye is treated by interstitial irradiation with radium a series of morbid changes may be observed in the eye. The main effect falls on the conjunctiva and skin of the lids, the eye itself, with the possible exception of the lens, being somewhat radio-resistant.

The first sign of any damage to the eye is a change in the appearance of the conjunctiva. The reaction of the conjunctiva to radium is characterized by oedema, hyperaemia, and a serous discharge. On account of the laxity of the subconjunctival areolar tissue the oedema of the bulbar conjunctiva may be intense. With an average therapeutic exposure the reaction begins a few hours after insertion of the radium and reaches its maximum between the fifth and eighth days, fading slowly to normal about three weeks later.

When the conjunctival sac is irradiated uniformly the whole conjunctiva will become oedematous, but the swelling will be greater in the lower fornix on account of the influence of gravity. When the radium is eccentrically placed intense chemosis on the exposed side of the eye may give place to a normal membrane on the other side of the same conjunctival sac. Swelling of the conjunctiva may be so great after heavy irradiation that the lids are pushed apart and the glistening red swelling overlaps the lower lid and spreads across the limbus on to the cornea. The upper lid may be so raised that the cornea is in danger of ulceration from exposure.

Hyperaemia increases with the swelling, and its greatest intensity marks the height of the reaction. Whether the conjunctiva or the skin of the lids shows the greatest reaction in a given case appears to depend chiefly upon which of the two is nearer to the source of irradiation. It has been observed that radium implanted into the orbit behind the eye can produce a severe conjunctival reaction without ascertainable change in the skin of the lids. It is possible that oedema of the orbital cellular tissue may contribute to the swelling of the bulbar conjunctiva under these conditions, for proptosis has been observed to follow interstitial irradiation of the back of the orbit by needles introduced through an opening in its outer wall. In this case the eye came forwards as the conjunctival reaction developed and receded again as it faded. A similar transient proptosis has been reported as the result of the introduction of radon seeds behind the eyeball.

Whilst the conjunctival reaction is still increasing a serous discharge from the conjunctival sac appears usually between the third and fifth days after irradiation is commenced. This discharge is not in proportion to the degree of reaction, and may be slight even in those cases which show severe chemosis with a skin reaction. Sometimes the discharge may be sanious, especially where the neoplasm has involved the conjunctiva. Often the discharge becomes muco-purulent and the normal conjunctival reaction is masked by a true inflammatory conjunctivitis of minor degree. This complication is seen usually where a pathological micro-organism is found in the conjunctival sac before irradiation, and especially where the eye has been closed either by a severe radium reaction or as part of the treatment.

Pain is not a feature even of a severe conjunctival reaction. Pain during the stage of active and subsiding conjunctival reaction suggests the onset of irradiation iritis. The patient complains of stiffness and pricking in a normal conjunctival reaction. Conjunctivitis increases the feeling of irritation without causing actual pain.

A severe localized reaction results when radon seeds are used in close proximity to the conjunctiva. The reaction reaches its maximum during the first days after the seeds have been implanted.

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When the eye is irradiated by a 1-gramme radium unit the conjunctival reaction is slight. This observation has been made on cases of carcinoma occurring in the upper jaw, in which the eye was displaced upwards by the growth before irradiation was commenced. Treatment by the "bomb" varied from twenty to forty-eight hours, but in each case the eye was directly exposed to irradiation, and on account of the involvement of the orbital plate of the maxilla in the growth an additional screen applied to the eye direct would have rendered the treatment less efficient. The conjunctival reaction reaches its maximum after about sixteen or eighteen days at the same time as the maximum skin reaction is seen. Some chemosis occurs with little hyperaemia, but the degree of swelling is not sufficient to prevent normal blinking. Even where the skin reaction has been so intense that moist desquamation has resulted the conjunctival reaction is of a minor degree.

Fading of the conjunctival reaction after interstitial irradiation is gradual. Usually the hyperaemia disappears, leaving a straw-coloured area of oedema of the conjunctiva. This returns to normal in about three weeks after removal of the needles. Even the chemosis of the conjunctiva caused by a tumour near the orbit will disappear after irradiation, provided that the tumour has been adequately treated. Conversely, if chemosis of this type, together with some or all of the additional chemosis associated with the radium reaction, persists after irradiation there is a strong presumption that treatment has been inadequate. Sometimes, and especially in those cases where radium needles are used very near the conjunctiva, large superficial conjunctival vessels may persist permanently or may appear some weeks after the conjunctival reaction has faded. This telangiectactic effect is not usually accompanied by a discharge.

Conjunctival Reaction: Late Effects

A severe conjunctival reaction may be followed by scarring of the conjunctiva. Three to four months after interstitial irradiation the conjunctiva begins to thicken and shrink, and often adheres to the sclera. The normal transparency is lost and the thickened conjunctiva may in the course of years become densely white. Where a localized reaction has occurred this effect may be confined to the corresponding area. In some cases a thickened band of white conjunctiva passes from the inner side of the lid to the globe, so that movement of the latter away from the scar is limited. Contraction of the scar is so gradual that diplopia is not noticed by the patient, though it may be elicited on examination.

If the whole of the conjunctival sac has been irradiated equally with a relatively large amount of radium, and the needles have been inserted into the orbit in close proximity to the conjunctiva, the whole of the conjunctival sac will be involved in the process. The fornices become obliterated and the thickened conjunctiva passes directly from the lids on to the sclera, to which it becomes so firmly adherent as to restrict movement of the globe in all directions. If an excision of the eye becomes necessary this adhesion makes it difficult to separate the conjunctiva from the sclera. Healing of the incision in the damaged conjunctiva may take months. After the eye has been removed the conjunctiva shrinks so completely that during the second year after irradiation only a narrow pink crack can be seen when an attempt is made to separate the lids.

After the use of radon seeds localized conjunctival scars, accompanied by injection of the conjunctival vessels, are very common. These scars may be confined to the bulbar conjunctiva. Thickened folds of conjunctiva radiate from a depressed centre, which is adherent to the underlying sclera.

After irradiation with the 1-gramme unit the degree of scarring of the conjunctiva is negligible. The change in the conjunctiva is more in the nature of a slight loss of elasticity and ageing rather than a pathological process. No case in which the blood vessels have been permanently enlarged has been observed, but occasionally the eye has remained slightly red for some months.

Scarring of the lid margins is common after interstitial irradiation, but damage to the tarsal plate has not been observed. The whole or a part of the lashes may be permanently lost, and when this occurs the edge of the lid becomes rounded, so that the skin passes without appreciable change into the scarred conjunctiva.

In one case movement of the eye was so much diminished that fusion between the rounded margin of the lid and the scarred conjunctiva occurred. This conjunctiva was exposed in consequence of retraction of the lids, and gradually took on the appearance of skin.

Irradiation may lead to such scarring of the skin of the lower lid as to produce cicatricial ectropion. When of lesser degree the ectropion may be limited to eversion of the lower punctum. The tears then run down the cheek. In cases where the edge of the lid has become rounded the punctum is frequently obliterated and all trace of it disappears. When localized irradiation, for instance, of a basal-cell carcinoma near the inner canthus has obliterated one or both puncta the patient will have epiphora. Where irradiation has been so intense as to abolish the secretory activity of the lachrymal gland epiphora may be absent in spite of obliteration of the puncta. A small localized scar may result from the use of radon seeds in the lower lid. The contraction of this scar may be so severe that a nick in the contour of the lid margin is formed which allows the tears to run over. Scarring of the conjunctiva and lids is especially prone to follow the use of unscreened or lightly screened radium, but with increasing knowledge of its dangers these severe scars will be seen less often.

After irradiation with the 1-gramme unit an analogous scarring of the conjunctiva and of the lid margin can occur, but the change is of a minor character. Rounding of the lid margin with permanent epilation has only once been seen, and in this case there was epiphora from eversion of the punctum.

Involvement of the Iris

The cornea and iris are affected only by relatively intense irradiation, and should, in the light of present knowledge, show no change as a result of radiotherapy. No reaction has been observed in either as a result of treatment with the 1-gramme unit. During the stage of radium reaction in the skin and conjunctiva discomfort only is felt in the eye. Pain is a sign that the iris has been affected. It is experienced during the first few weeks after the radium has been removed, when the conjunctival reaction has reached or has just passed its height.

The changes which have been observed in the iris vary from a slight swelling—iris reaction—only measurable by failure of the pupil to respond to homatropine as fully as before irradiation, to a definite iritis characterized by posterior synechiae. I have never yet seen K.P. The synechiae are formed in that part of the iris which is most exposed to irradiation. They break down readily under the action of a mydriatic, and may do so of their own accord without treatment. Irradiation iritis is distinguished from all ordinary forms of iritis by its tendency to resolve spontaneously without relapse.

Radium Necrosis of the Cornea

The chief morbid change in the cornea is ulceration, which may be a direct result of irradiation—radium necrosis—or may arise indirectly for one or more of the following reasons.

The cornea may become relatively dry, because the secretory activity of the lachrymal gland has been reduced by irradiation.

Closure of the eye may be prevented by massive oedema of the conjunctiva which has not been controlled by

preliminary apposition of the lids. The exposed cornea will then become superficially ulcerated, but will heal without a scar if it can be covered by the lids. Pain is more severe than in radium necrosis of the cornea.

At a later date, if ectropion has followed irradiation, the lower part of the cornea may ulcerate from exposure, even without damage to the lachrymal gland.

Radium necrosis of the cornea is the most serious result of irradiation, and is usually associated with radium necrosis of skin or bone. It appears as a delayed reaction about three months after a single intensive irradiation, but the time of onset varies and is dependent on the intensity of the irradiation. A severe necrosis may appear shortly after a repeated irradiation, even where the initial treatment has been by the 1-gramme radium unit or by deep *x*-ray therapy.

Diminution of sensation is the earliest sign of damage to the cornea. On touching the cornea lightly with cotton-wool, blinking is slower than in the normal eye. This effect may appear within a few weeks, persist for months, and disappear leaving the sensation of the cornea normal. I have seen diminution of sensation of the cornea on one occasion follow intensive irradiation with the 1-gramme unit. Normal sensation was eventually restored. But diminution of the corneal reflex to light touch may prove to be the forerunner of a radium necrosis of the cornea.

Radium necrosis begins with a loss of polish of the cornea, usually at the centre, but where the irradiation has been directed from the side the effect may be confined to the corresponding sector, the cornea at a distance being normal. Within a few hours loss of polish is followed by the appearance of one or more small superficial ulcers, which have a smooth base and undermined edges. The process may be arrested at this stage, but as a rule the ulcers spread slowly and coalesce to form one large ulcer, which may involve the whole cornea, except for a narrow rim at the periphery. Alternatively, a single ulcer may extend by stripping up the epithelium, so as to form one or more ridges radiating from its margin. The summits of these ridges split and the edges of the splits become undermined.

Up to this point radium necrosis of the cornea bears a strong clinical resemblance to neuro-paralytic keratitis, but differs from it in having a slower onset and a remarkable resistance to infection. It is only after some weeks that the onset of a mild infection is indicated by punctate infiltration around the ulcer. There is little reddening of the eye and no ciliary injection in the absence of iritis. If the eye is kept covered and a mydriatic is used the ulcer may remain stationary and the patient comfortable for months. The spread of infection in these eyes is so slow that it may be months before the ulcer begins to extend and to develop points of yellow exudate in its base. With this there is increase of the punctate infiltration and deep striation appears in the cornea. A mild iritis, which yields readily to treatment, may be set up by an extension of the corneal infection.

Pain is not an outstanding feature of radium necrosis. Even when a large ulcer is present little complaint is made.

Radium necrosis of the cornea tends to progress to perforation, and when this occurs the anterior chamber is open to invasion by micro-organisms from outside. The natural resistance of the interior of the eye to infection must be considerable, for it is usually some weeks before a mild enophthalmitis begins. Radium necrosis of the cornea is an aseptic destruction by a physical agent. When it perforates the edges of the opening do not necessarily contain pathogenic micro-organisms, though they are slow to heal because they have been irradiated. These two factors probably account for the delay in infection of the whole eye.

Occasionally a severe necrosis may take place quite rapidly. The whole cornea separates painlessly. I have seen this catastrophe in some of the earlier cases after repeated irradiation complicated by sepsis in the neighbourhood. It was not associated with conjunctivitis. In one case the cornea separated, followed by the iris and lens. The whole eye disintegrated so completely that there was no recognizable trace of the sclera three days later when the orbit was exenterated. In another case sloughing of the cornea was followed by loss of the iris and lens with subsequent panophthalmitis.

Repair of Damaged Cornea

Provided that the reparative powers of the cornea have not been destroyed healing will take place slowly. When the ulceration is shallow and before the whole cornea is involved repair without opacity in about four months is possible. For this it is essential that the condition be recognized early and that the ulcer be covered by tarsorrhaphy. If a cornea which has been protected by tarsorrhaphy is irradiated it may still develop ulceration, but heals without opacity. A deep ulcer may take up to eight months to heal. A dense leucoma may form with superficial vascularization of the cornea, the density being proportionate to the depth of cornea lost. A perforation of the cornea from radium necrosis has been seen to heal, even without tarsorrhaphy. Ultimately vision depends on the position of the corneal opacity, on the degree of residual astigmatism, and on the possible development of an irradiation cataract.

Irradiation Cataract

Radium cataract is usually a late reaction to irradiation, and appears two years or more after exposure. No record has been found in the literature of an early radium cataract which became mature, although one case has been reported in which small vacuoles were seen in the lens ten days after the insertion of two radon seeds. One seed was near the lens and both were of high intensity. The vacuoles disappeared within fourteen weeks.

I have been fortunate enough to see one case of early mature radium cataract. It followed an extensive interstitial irradiation, the orbital part of which consisted of six 2-milligramme needles arranged symmetrically round the eye. The lens was therefore irradiated heavily from all sides. Three days after removal of the needles a few subcortical opacities of the radiating senile type were seen in the anterior and posterior parts of the lens. Four weeks later 1.5 dioptres of myopia had developed, and vision was slightly reduced by a fine uniform haze throughout the lens. The senile striae had also increased. Seven weeks after removal of the radium the cataract was mature. The changes in the lens preceded, and therefore were not secondary to, the attack of irradiation iritis which followed.

The typical irradiation cataract is a posterior cortical one. It may follow exposure to various forms of irradiation, and its occurrence has been recorded in the literature for the last thirty years. The earlier examples followed exposure to *x* rays. After exposure to radium it usually develops during the second and third years, though its appearance may be delayed until the sixth year or later.

Radium cataract begins in the posterior part of the lens with vacuoles which are not quite circular. Fine spots and feathery lines appear among the vacuoles, and all the changes extend outwards and forwards in the lens until there is a posterior opacity, with its margin denser than its centre. The cataract may be arrested at this stage or may go on to maturity. When it goes on to maturity striae of the ordinary senile kind are formed, sometimes with vacuoles beneath the anterior capsule. Fine punctate opacities appear scattered throughout the lens. They are seen first in the part of the lens most exposed to irradiation. The cataract becomes mature by the gradual evolution of these changes. The mature radium cataract possesses no special features, but if occasion arises is amenable to operative treatment.

Among the early cases of this series there were two examples of late radium cataract, both of which were mature when first seen. Both were treated with needles of high linear intensity, lightly screened with 0.3 millimetre of platinum. In both

patients the cataract developed on the side irradiated and the other eye remained clear. After 1931 the platinum screen was increased to 0.8 millimetre for interstitial irradiation near the eye, and in 1933 a 1-gramme unit became available. Since then radium cataract has not been seen.

It is probable that delayed radium cataract arises from interference with the nutrition of the lens, caused by endarteritis and telangiectatic changes in the ciliary body. As these changes are much less in degree after mass irradiation than after interstitial irradiation it is possible that late radium cataract may not follow its use, but it is only four years since "bomb" treatment was started at University College Hospital, and it is therefore too soon to be certain.

It must always happen that many patients who suffer from malignant disease, needing treatment by radium, die of their disease before there has been time for late radium cataract to develop.

In this series of cases no changes have been seen in the fundus as a result of treatment of neighbouring tumours by interstitial or mass irradiation. This is in striking contrast with the effect of radon used in the treatment of intra-ocular growths, but, of course, these methods of irradiation are not strictly comparable.

In no case has the other eye been damaged by or involved in any type of radium reaction.

Management of a Case in which Damage to an Eye May Occur

When interstitial irradiation of the tissues round the eye is proposed the cornea is first protected by stitching the lids together as before division of the sensory root of the fifth nerve. The degree to which the conjunctiva can swell is then limited by the pressure of the lids.

As the closure of an eye always carries a tendency to conjunctivitis the eye is washed twice a day with normal saline without disturbance of the stitch holding the lids. Muco-purulent discharge necessitates more frequent irrigation. The neighbouring skin, where exposed to irradiation, is protected from wetting by sterile vaseline. Sterile vaseline is also smeared on the lid margins to prevent the lashes sticking together. The metallic preparations such as silver or zinc should not be used, as they may give rise to secondary radiations.

The stitch holding the lids together is kept in place until the skin reaction is definitely fading. The tendency is to remove it too soon. The swollen conjunctiva immediately fills the palpebral aperture and flows over the lower lid. It then dries, and so increases the discomfort of the patient. If the stitch has been removed too soon an attempt must be made to close the eye by strapping the lids together. Occasionally the lids will not meet and must be strapped across the prolapsed conjunctiva. If it is not possible to cover the cornea with the lids a Buller's shield will keep it moist and protected from dust.

When tumours in the neighbourhood of the eye are treated by the 1-gramme unit the conjunctival reaction is often so slight that stitching, or even strapping, the lids together is unnecessary. In any case the onset of the reaction is so gradual that ample time is allowed for closure of the eye should this be required.

If the eye is displaced by a tumour it will gradually resume its normal position after irradiation. During this process any tendency to diplopia will be lessened if both eyes can be kept open.

So long as the lids are stitched together the eye cannot be examined, and the only clue to the state of the iris lies in the subjective sensations of the patient. He may feel irritation, stiffness, or pricking as a result of the conjunctival reaction, but pain suggests iritis. The pain is worse at night, when the pupil is contracted in sleep, and may be very severe. If the pain is relieved by homatropine the diagnosis of iritis is confirmed, and treatment by atropine can be instituted. The synechiae of irradiation iritis are lightly attached to the anterior lens capsule and give way easily, so that full dilatation of the pupil is soon obtained. As irradiation iritis tends to resolve spontaneously without relapse the atropine can be reduced as soon as the pain is under control. The mydriatic can be discontinued sooner than in the treatment of a true inflammatory iritis.

All cases where the eye has been exposed to intense irradiation should be seen once a week during the first six months. Radium necrosis of the cornea may begin about eight weeks after irradiation, particularly where the reaction has been so severe that an iris reaction or an irradiation iritis has occurred. The cornea is examined for diminution of sensation, as this probably precedes desquamation of the superficial layers. The greatest loss of sensation will be in the sector exposed to the maximum irradiation. Whenever it is thought possible that radium necrosis may occur the cornea is stained with fluorescein at each examination. This is particularly important after repeated irradiation. Shallow areas of necrosis give rise to so little pain and so little reddening of the eye that their existence may not be suspected unless the cornea is stained. At this early stage the cornea may heal with palliative treatment alone.

Healing without opacity is made much more certain by tarsorrhaphy, but even then may take from four to eight months. The lids should be split to secure firm union, and the stitches should be left in place for four weeks. In the presence of infection or of progressive necrosis tarsorrhaphy offers the chief hope of preventing perforation.

If the cornea perforates it is probably useless to try to save the eye. Healing of the perforation is unlikely. The usual result is an enophthalmitis of low grade, which only gives clinical evidence of its existence some weeks after the perforation. Perforation of the cornea is an indication for removal of the eye. Owing to the shrinking of the conjunctiva and of the palpebral aperture which follows irradiation an artificial eye cannot be worn.

Conclusions

The observation of eyes which have been exposed to radium irradiation of destructive intensity has demonstrated a series of morbid changes leading progressively to radium necrosis of the cornea and loss of the eye.

When treatment of neighbouring malignant tumours is by interstitial irradiation these changes can be reduced by adequate screenage of the radium needles.

After mass irradiation by a large quantity of radium at a distance the damage to the eye is negligible.

As greater quantities of radium become available, and facilities for the use of mass irradiation become more widely distributed, it is to be hoped that damage to the eye by interstitial irradiation will cease to be of more than historic interest.

The lecture was illustrated by lantern slides. The cases upon which it is founded are reported in:

Martin, P. (1933). *Tr. Ophth. Soc. U. Kingdom*, **53**, 246.
—— (1936). Ibid., **56**, 87.

It has been decided to wind up the Zunz Fund and each of the thirty-four London hospitals which have received grants from this fund for the past thirty-eight years has been offered by the trustees its share of the capital, which totals approximately £425,000. Wards maintained by the grants were named "Annie Zunz." The present distribution of the capital was provided for in the will of Siegfried Rudolf Zunz, a wealthy merchant who died in 1899. The winding up of the estate was to take place on the death of a specifically named annuitant, which has now occurred.

ISOLATION OF THE INFLUENZA VIRUS AND THE RELATION OF ANTIBODIES TO INFECTION AND IMMUNITY

THE MANCHESTER INFLUENZA EPIDEMIC OF 1937

BY

LESLIE HOYLE, M.B., Ch.B.*
Royce Research Fellow

AND

R. W. FAIRBROTHER, D.Sc., M.D., M.R.C.P.†
Lecturer in Bacteriology
(From the Department of Bacteriology and Preventive Medicine, University of Manchester)

The recent extensive epidemic of influenza has afforded an opportunity of confirming the observation of Laidlaw and his colleagues (1933) that the disease is due to a filterable virus. The failure to isolate strains of influenza virus during the past two to three years in Manchester has recently been reported (Fairbrother and Hoyle, 1937). This was an interepidemic period, and our failure in this respect was similar to that experienced by other workers who have so far only isolated the virus from patients affected by the epidemic form of the disease. The present epidemic has consequently enabled us to obtain a plentiful supply of material and more extensive investigations have been possible. These have been directed mainly to (1) the isolation of the virus, and (2) to determining the relation between the presence of antibodies and protection.

Isolation of the Virus

Saline broth washings from the upper respiratory tract and material expectorated directly from the trachea, in cases in which tracheitis was an initial symptom, were collected during the early stages of the disease and instilled intranasally into ferrets anaesthetized with ether. A careful bacteriological examination of all the specimens was made by the methods previously employed by one of us (Hoyle, 1932) in work on upper respiratory infections, special attention being paid to the isolation of *H. influenzae*. There was no evidence of the participation of any one pathogenic organism in the epidemic. *H. influenzae* in particular was notably absent ; it was demonstrated in only one specimen.

The inoculated ferrets were watched closely for the appearance of symptoms, and regular temperature readings were taken. In all, twenty-eight separate specimens from characteristic cases of epidemic influenza have been examined, and in thirteen cases (46 per cent.) the typical infection developed in the ferret. In all instances the condition was passed serially in the ferret while regular attempts were made to produce lesions in mice. In the ferret the characteristic rhino-pharyngitis developed with nasal obstruction, laboured breathing, and pyrexia in thirty-six to forty-eight hours ; the animals were then killed and material collected for passage. The general signs of infection were identical with those following the inoculation of ferrets with the W.S. strain of virus kindly sent to us by Dr. Wilson Smith.

The cases investigated by us are probably representative of the epidemic, as they were obtained from widely scattered areas in the vicinity ; some were from hospitals and others from general practice. In one case the original infection undoubtedly took place in London. It is interesting to note that direct tracheal exudates gave the best results, saline broth washings being much less successful.

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† In receipt of a grant from the Royal Society.

The failure to isolate the virus from every case examined is probably largely due to a number of technical difficulties. In some instances the material received either was of an unsuitable nature or was delayed in transit. Also, owing to shortage of ferrets, we were compelled to restrict our inoculations to one animal only for each case, and serial passage had to be reserved for those in which a typical infection occurred. Some ferrets that developed mild indefinite symptoms without fever were abandoned. We have little doubt that under ideal conditions the proportion of successful isolations of virus would have been much higher.

Identification

It is well known that there are two related but distinct strains of the influenza virus—human and swine. The human strain only has been isolated from human influenza. The swine virus, together with *H. influenzae* (suis), is responsible for swine influenza, a condition occurring in the Middle-West States of America. It is serologically related to the human strain, having a common antigenic factor, and in view of the frequent presence of antibodies against the swine virus in adult human serum Laidlaw (1935) has suggested that the swine virus was responsible for the 1918–19 pandemic and that the human virus is concerned with the general epidemic form. It is therefore of some importance that the strains should be identified in view of the extent of the recent epidemic, which has been practically of pandemic proportions. This identification is carried out most satisfactorily by quantitative neutralization tests in mice.

Attempts were made at each stage of ferret passage to infect mice with the strains isolated. This, as other workers have reported, is often difficult with the human virus but is less difficult with the swine virus. Our strains behaved in this respect as the human type ; the first passage from ferret to mice often produced lesions, but attempted passage of these was usually unsuccessful. Even after five to seven passages in the ferret mice could not be consistently infected. So far only four of the thirteen strains isolated have been satisfactorily adapted to mice.

We examined strains by neutralization in either ferrets or mice and found that they were all of the human type. The tests were carried out against an immune horse serum (I.H. 2, Laidlaw *et al.*, 1935) and specific antisera collected from immunized swine by Dr. Shope. The results with the Manchester strains and the W.S. (Hampstead) strain were identical, and indicate clearly that the human virus was responsible for the epidemic. The viruses were neutralized by the anti-human sera but not by the anti-swine sera.

Antibodies as an Index of Protection

Antibodies against the human and swine viruses can be readily detected by neutralization or complement-fixation tests. They have been demonstrated in the serum of normal individuals, the percentage of persons with such antibodies being higher in urban than in scattered communities and increasing with age. They are specific for the virus, and their presence is generally considered to indicate previous clinical or subclinical infection. We found (1937) that the complement-fixation test was more suitable than the neutralization test for the quantitative examination of large numbers of sera. In this reaction, however, antigens made from the human and swine strains behave alike, this being due to the presence in the two viruses of a common antigenic component. This test does not therefore give any indication of the type of the infecting virus—that is, whether it is human or swine.

We have recently examined a random collection of sera taken during the interepidemic period when influenza was rare. Antibodies to a relatively low titre were found in about 50 per cent. of the samples. A similar investigation was carried out on the serum of individuals two to three weeks after recovery from influenza, and a marked increase in the antibody content was usually found. These individuals were not selected but were generally representative, the ages varied from 17 to 78 years, and in some instances they were suffering from chronic diseases such as pernicious anaemia. A comparison of the two series of results is given in Table I.

TABLE I.—*Complement-fixation Titres of Normal and Convalescent Sera*

Titre	Number of Normal Sera (pre-epidemic)	Number of Convalescent Sera (post-epidemic)
1 in 128	0	9
1 in 64	0	13
1 in 32	0	14
1 in 16	2	10
1 in 8	15	11
1 in 4	60	8
1 in 2	63	0
Doubtful (1 in 2)	64	0
Negative (1 in 2)	96	0
Total number ...	300	65

There is a definite increase in the general titre of the convalescents; all had a titre of 1 in 4 or over, while with the normal sera some 75 per cent. gave a reading of 1 in 2 or under. This marked rise was not unexpected, as there is no doubt that convalescents possess a high degree of immunity to the virus. Francis and Magill (1935) have shown by neutralization tests that antibodies are specifically stimulated by infection with the influenza virus. The highest titre previously obtained by us during an examination of 300 normal sera was 1 in 16, and this had only been found on two occasions. In contrast to this several sera from convalescents gave a titre of 1 in 128. These results indicated that an advance in titre had followed the infection. In a few instances, however, there was apparently little increase in the antibody titre. This is not unexpected, as it is well known that the antibody response of individuals following a similar stimulus is very uneven.

An opportunity was afforded of examining the serum of individuals in a hospital ward in which there had been an outbreak of influenza. Samples were collected from cases of influenza and from individuals who had escaped infection. A high titre was found in the majority of convalescents and in most of those who had been clinically free from infection (see Table II). This suggests that possibly those who escaped were immune by virtue of the presence of antibodies and that in some the titre was augmented by subclinical infection. It will be noted that one person who had no detectable antibody escaped, and also that two others had a low titre (1 in 2).

TABLE II.—*Titre of Sera of Patients in a Hospital Ward Twenty Days After the Outbreak of Influenza*

Fixation Titre	Influenza Convalescents	Individuals Escaping Influenza
1 in 128	3	2
1 in 64	4	1
1 in 32	2	0
1 in 16	0	1
1 in 8	1	1
1 in 4	2	0
1 in 2	0	2
Doubtful (1 in 2)	0	0
Negative (1 in 2)	0	1
Total	12	8

More definite evidence of the increase in titre following infection was forthcoming from an examination of individuals before and after the attack (see Table III).

TABLE III.—*Serum Antibodies Before and After Influenza*

Case	Titre of Complement-fixing Antibodies		Presence of Neutralizing Ant bodies	
	Before	After	Before	After
R. W. F. ...	0 (1 in 2)	+ (1 in 64)	0 (1 in 2)	+ (1 in 4)
M. H. ...	0 1 in 2)	+ (1 in 64)	0 (1 in 2)	+ (1 in 3)
B. H. ...	± (1 in 2)	+ (1 in 32)	0 (1 in 2)	+ (1 in 4)
S	± (1 in 2)	+ (1 in 8)		
McG. ...	± (1 in 2)	+ (1 in 4)	± (1 in 2)	+ (1 in 4)

0 = negative fixation or ab ence of neutralization.
± = partial fixation or incomplete neutralization.
+ = positive fixation or complete neutralization.
The figures in brackets indicate the titre of fixation and the highest dilution tested by neutralization.

Although only a few cases were examined a marked increase in neutralizing and complement-fixing antibodies was found in all; in two of these cases (R. W. F. and M. H.) it is interesting to note that the virus was isolated from the patient.

The following point at once arose: Was the presence of antibodies any indication of resistance to infection? It is impossible to give a definite answer to this important question. Our results suggest, however, (1) that if complement-fixing antibodies are present to a titre of 1 in 4 or higher there is likely to be an associated clinical immunity, and (2) that other factors may be involved in resistance to infection.

We were able to test the serum of forty-four individuals at the beginning of the epidemic. The relation of the titre to the incidence of the disease is given in Table IV.

TABLE IV.—*Relation Between Fixation Titre and the Incidence of Infection*

Complement-fixation Test Titre	Number of Sera	Number Developing Influenza
1 in 16	2	0
1 in 8	5	0
1 in 4	10	0
1 in 2	11	0
Doubtful (1 in 2)	8	3
Negative (1 in 2)	8	2
Total	44	5

Influenza developed only in those whose serum in a 1 in 2 dilution gave a doubtful or a negative reading. It may also be noted that some individuals whose serum gave a low reading did not become infected. As this might have been due to the presence of neutralizing antibodies which were not demonstrated by complement-fixation neutralization tests were carried out. Only one of nine sera

giving no fixation showed any neutralizing antibodies, and in this case only partial neutralization was given by the serum diluted 1 in 2. The explanation might be that other factors are involved in resistance to the virus or that those who were not infected had not been exposed. In either event the provisional conclusion that the presence of complement-fixing antibodies indicates some degree of clinical immunity seems justified, as no cases of influenza occurred in those giving a positive reading.

Further facts to support this argument are: (1) One of us (L. H.) had a complement-fixation titre of 1 in 16 before the epidemic began. In spite of the fact that he has been in close and continued contact with infected material and that three cases developed in his household, he remained quite unaffected. (2) A second person, who also had a titre of 1 in 16 before the epidemic began, was in close contact with three cases of influenza, apparently infected one from the other during the course of their illness, and remained well throughout.

Discussion

Convincing evidence has been obtained that the human type of influenza virus, identical with that isolated in other places, was the primary aetiological agent in the recent epidemic of influenza in Manchester. Not only was the virus isolated from a number of cases, but there was also a definite increase in the antibody titre of convalescent sera as demonstrated by complement-fixation. In a few instances it was possible to examine the serum before and after an attack, and in each case an increased titre was recorded.

The results also suggest that individuals with a low antibody titre are more susceptible to infection than those with a high titre. This may be of some practical value, as recent work indicates that prophylactic vaccination may soon be available for general application. Francis and Magill (1937) have been able to produce a decided rise in antibody titre by the subcutaneous injection of living culture virus without causing any signs of infection. They suggest that this increase in circulating antibodies is accompanied by an increased ability to combat the natural infection. It follows, therefore, that if it is possible to differentiate immune from susceptible persons the application of active immunization will be assisted. The complement-fixation test is the most satisfactory of the tests at present available for this purpose, and is also the most simple to apply. By our method a titre of 1 in 16 or over suggests a high degree of immunity, while it seems probable that titres of 1 in 4 or 1 in 8 may represent an immunity sufficient to prevent infection in a mild epidemic.

Conclusions

1. The human type of influenza virus was the primary aetiological agent in the recent epidemic of influenza in Manchester.

2. The influenza virus has been isolated from thirteen cases of epidemic influenza and all strains examined were identified as the human type.

3. No evidence was obtained to indicate that any pathogenic organism (in particular *H. influenzae*) was involved in the cases examined.

4. By means of the complement-fixation test a high antibody titre was generally found in convalescent sera.

5. This test provides a possible method for differentiating immunes from susceptibles, and may prove of value when a satisfactory prophylactic is available.

We wish to express our gratitude to the many persons who have assisted in the collection of material.

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CONTINUOUS OPEN AIR FOR PNEUMONIA IN CHILDREN

BY

H. L. WALLACE, M.B., F.R.C.P.Ed.

Assistant Physician, Royal Edinburgh Hospital for Sick Children; Lecturer in Child Life and Health, University of Edinburgh

The treatment of acute primary pneumonia in children is a subject which, more especially in the winter months, must provoke anxious thought and interest. While it is well recognized that alveolar or lobar pneumonia occurring in the older child is in the majority of cases a self-limiting illness having a comparatively low mortality, it has to be admitted when the disease is considered in all its aspects and in children of all ages that pneumonia still remains one of the commonest and most serious infections of childhood, claiming a vast number of victims each year.

The object of this paper is not to enumerate the various forms of therapy that may be employed in the treatment of pneumonia in children, but rather to stress the importance of one particular remedy which by its very simplicity can be almost universally applied. Since Claude Ker (1904) advocated the open-air treatment of bronchopneumonia complicating measles and whooping-cough, conceptions regarding the management of patients suffering from this disease have completely changed, and the majority of physicians are personally convinced that the era of the hermetically sealed window and the stuffy sick-room is rightly gone for ever. In spite of this general conviction, however, there would still appear to be considerable divergence of opinion as to whether all cases of acute pneumonia should be treated in the open air as a routine measure or whether such a regime should be limited to certain selected types of the disease. Furthermore, there does not appear to be any universal plan applicable to this form of treatment, since it is found that even in the most authoritative works on diseases of children a variety of opinions is expressed, and not infrequently there is noted a lack of precision as to what exactly is meant by open-air treatment. For example, is exposure to open air beneficial in all types of acute primary pneumonia in children of all ages, or should this plan of therapy be reserved exclusively for cases of bronchopneumonia or only for cases of lobar pneumonia? And if it be decided that the patient would benefit from some form of open-air treatment, should he be exposed to all the winds that blow, or should he, though placed in a well-ventilated atmosphere, be protected from draught?

During recent years it has been the practice in one of the wards at the Children's Hospital in Edinburgh to submit every case of pneumonia on admission to an intensive open-air regime. This is carried out irrespective of the season of the year or of weather conditions, with the one exception of fog, each child being placed on the windward side of the ward beside a widely opened window so that the cold air from without plays directly on the child's face. The aim in each case is to ensure that the maximum of cold air blows directly on to the child, an

entirely different procedure from what is usually understood by the somewhat ambiguous advice that "the child should be nursed in a well-ventilated room, adequately protected from draught." An essential precaution is, of course, that the patient should be warmly clad so as to prevent chilling, the face being the only part of the body exposed to the air. All cases of pneumonia are thus treated, both day and night, until the temperature falls and remains at the normal level. This somewhat rigorous method of treatment has now been thoroughly tested in approximately 300 consecutive cases of pneumonia, and the impression formed, not only by the physicians attached to the ward but also by the nursing staff, is that exposure to a moving current of cold air in this manner is the means of saving lives in children of all ages suffering from acute primary pneumonia. In this connexion certain of the more striking clinical impressions may be worthy of record.

Clinical Impressions of the Treatment

It must first of all be stated that the treatment of pneumonia in the manner described appears to be free from all danger to the patient concerned, and in this series of cases it has not been possible to attribute to the cold air any ill effect whatsoever. One of the most interesting features is the attitude of the child towards this mode of treatment, since it is frequently observed that interruption of the flow of cold air by closure of the window tends to make the child fretful and restless, and that when the window is reopened he will almost immediately subside into a peaceful sleep. This impression is very striking and has been frequently noted, and it is a significant fact that sedative drugs are but rarely required to induce sleep or to allay restlessness. Another important feature is the effect of the open air on the child's appetite; it is exceptional to experience any difficulty in persuading the patient to take nourishment if treated in this manner. Apart from small doses of brandy, stimulants are hardly ever required except in the most desperate cases, and the administration of oxygen, either with or without carbon dioxide, has been almost entirely abandoned as irrelevant. Thus cold air appears to bring comfort to the patient, aids his appetite, and helps to render unnecessary other forms of treatment which may prove exhausting to a young child suffering from an acute illness.

Control Cases

When an attempt is made to assess the efficacy of any special method of treatment it has to be realized that clinical impressions are not sufficient, and one of the most difficult obstacles to overcome is that of obtaining suitable control cases for the purpose of comparison. This difficulty is very apparent in a disease such as pneumonia, which probably varies both in severity and in type from year to year, and it would therefore be of little value to judge the effect of any therapeutic measure by comparing the mortality rate at the present time with that during previous years. In this investigation into the value of open-air treatment in pneumonia there is, fortunately, what may be regarded as an almost ideal series of control cases, inasmuch as the latter are consecutive cases of pneumonia admitted to one of the other wards of the Children's Hospital during exactly the same period.

This control group comprises 275 cases treated according to a somewhat different scheme. In this group those patients admitted during the cold winter months were not as a rule subjected to an open-air regime, but were treated by such measures as the continuous administration of oxygen, the exhibition of powerful stimulants, and the inhalation of air moistened by steam. The comparatively small minority admitted during the warmer months were in many instances placed adjacent to an open window, but always on the sheltered aspect of the ward and only when the weather was clement. Furthermore, open air was not favoured at any season of the year for the children in this group who were under 2 years of age. Thus there are two groups of cases: Group A, in which all cases were placed in the open air continuously and indiscriminately at all seasons of the year, and Group B, consisting of cases treated either by fresh air to a modified degree in the milder weather, or more frequently by various other forms of active therapy. It should be clearly understood that the difference in the management of these two groups of children is not merely one of degree, since in the control series an open-air regime was not employed as a routine measure, and in those cases where such a regime was adopted it was not carried out nearly so intensively as in Group A.

Comparative Mortality Figures

For the purpose of this survey the cases have not been classified according to bacteriological or pathological type, since there is as yet no uniformity of opinion as to the criteria which distinguish bronchopneumonia from alveolar pneumonia in very young children. Doubtless the view will still be confidently expressed by some that the vast majority of children under 2 years of age were suffering from bronchopneumonia. For this reason it was considered that a more accurate and a more intelligible comparison of the two groups could be made by dividing the cases in each group into various age periods rather than making a somewhat arbitrary attempt to differentiate pathological types. It is probably true also that the mortality rate in acute primary pneumonia is governed to a large extent by the child's age at the time of the illness, and a comparison of similar age groups in the two series will therefore afford reliable evidence. In consideration of the fact that this investigation is concerned entirely with treatment all cases in which the patient died within forty-eight hours of admission to hospital have been omitted from both groups, since it is probable that such cases were frequently beyond the scope of any form of treatment. Apart from this no selection whatever has been made in either group, and it is felt, therefore, that the two series are reasonably comparable.

Tables I and II show the number of deaths and the mortality per cent. in the two groups of cases, Group A representing those cases treated by the intensive open-air plan and Group B comprising the control cases. Owing to the very high mortality from pneumonia in infants as compared with older children the cases in each group have been divided into two large age periods.

TABLE I.—*Mortality Rate in Group A*

	Cases	Deaths	Per Cent.
Under 2 years ...	134	30	22.4
Over 2 years ...	158	4	2.5
Totals	292	34	11.6

TABLE II.—*Mortality Rate in Group B (Controls)*

	Cases	Deaths	Per Cent.
Under 2 years ...	136	51	37.5
Over 2 years ...	139	8	5.8
Totals	275	59	21.5

It will be noted that both under 2 years of age and over 2 the mortality is appreciably lower in Group A than in Group B, thus suggesting that treatment in the open air is beneficial alike to the very young child and to older children suffering from pneumonia. During a five-year period it is difficult to imagine that one particular ward in a hospital should admit all the severe cases of pneumonia whereas another ward in the same period admits all the mild cases, but it is conceivable that this state of affairs might occur to some extent during one particular year, and for this reason Table III has been prepared.

TABLE III.—*Mortality Rate During the Various Years*

Year	Cases	Mortality Per Cent.	
		Group A	Group B
1931-2... ...	113	6.0	27.0
1932-3... ...	93	13.5	19.5
1933-4... ...	105	9.2	23.5
1934-5... ...	124	13.4	17.5
1935-6... ...	132	14.5	19.0
Totals ...	567	11.6	21.5

In this table the mortality rate in the two groups is shown during each of the five years, and here it will be seen that although there is considerable variation in the mortality rates from year to year, in every instance the mortality in Group B is in excess of that in Group A. Thus it seems reasonable to assume that the difference between the two groups cannot be explained by an uneven distribution of cases, since the likelihood of this occurring during five consecutive years must be extremely remote.

Another possibility that had to be taken into account was a discrepancy in the age distribution in the two groups, and Tables IV and V show the age distribution and the mortality in Groups A and B respectively.

TABLE IV.—*Mortality at the Various Age Periods—Group A*

Age Period	Cases	Deaths	Per Cent.	
Under 6 months ...	14	10	71.4	
6-11 months... ...	43	10	23.3	8.6
12-23 months ...	77	10	13.)	
2-5 years	97	3	3.1	
6-12 years	61	1	1.6	
Totals	292	34	11.6	

TABLE V.—*Mortality at the Various Age Periods—Group B (Controls)*

Age Period	Cases	Deaths	Per Cent.	
Under 6 months ...	25	21	84.0	
6-11 months... ...	35	12	34.3	15.2
12-23 months ...	76	18	23.7	
2-5 years	84	8	9.5	
6-12 years	55	0	0.0	
Totals	275	59	21.5	

Study of these tables reveals the fact that Group B contains a relatively larger number of cases in which the children were under the age of 6 months, and this will perhaps tend to raise the general mortality for the whole group, since recovery from acute primary pneumonia during the early months of infancy is comparatively rare. If the first age period is discounted in both groups, however, it will be observed from the tables that the mortality still remains at a considerably lower level in Group A than in Group B. It is suggested, therefore, that the figures shown in all the above tables, whether considered individually or collectively, supply strong evidence in support of the favourable impressions formed at the bedside in connexion with the continuous open-air treatment of pneumonia in children of all ages.

Discussion

It has already been stated that the object of this investigation was to lay emphasis on one particular factor in the treatment of pneumonia in childhood. While it is readily admitted that for many years writers, both in this country and abroad, have advocated fresh air in the treatment of pneumonia, it is felt that the fundamental importance of this simple form of therapy is not sufficiently realized at the present day. The open-air treatment of pulmonary tuberculosis has long since ceased to be questioned, yet this simple but life-saving remedy has not as yet been whole-heartedly applied to other forms of respiratory infection. Old traditions die hard, and there can be little doubt that in many quarters it is still regarded almost as heresy to suggest that a child suffering from pneumonia accompanied by high fever should be nursed in the cold air.

Comparison of the two groups of cases in this series would appear strongly to justify the intensive open-air treatment in pneumonia in childhood, but it must be emphasized that such treatment will lose much of its beneficial effect if it is carried out in a half-hearted and timid manner. All the children in Group A were exposed to a moving current of cold air immediately on admission to the ward, and apart from adequate clothing were in no way protected from the draught. Furthermore, no distinction was made between bronchopneumonia and alveolar pneumonia, the treatment being the same for both types and for all ages. It is interesting to note that such treatment is not without physiological justification, since Leonard Hill (1936) has demonstrated that exposure of the face to a current of cold air causes a reflex dilatation of the bronchi and bronchioles, and this will tend to minimize respiratory distress and promote the maximum of aeration of the lungs. The remarkable peacefulness and comfort of the child treated in this way is probably a factor in lowering the mortality, owing to the minimum of strain being placed on the heart muscle. The increased appetite also enables a sufficiency of nourishment to be given without constant coaxing and cajoling, which can be so exhausting to a young child with pneumonia.

One obvious objection to open-air treatment carried out in hospital as described is the marked lowering of the ward temperature with a consequent danger to patients suffering from conditions other than pneumonia. This applies especially to marasmic and grossly debilitated infants, where it is frequently difficult to maintain the body temperature at a sufficiently high level. This real difficulty would be obviated if every children's hospital contained a special ward constructed according to sanatorium principles for treating cases of acute pneumonia. In view of the large number of respiratory cases admitted to hospital each year such a plan would be well worth while, since it would probably be the means of saving many lives. It is perhaps beyond the scope of this paper

to comment on the treatment of pneumonia in adults, but the view may be expressed that the continuing high mortality from this disease might be considerably reduced if the large general hospitals throughout the country were to provide better facilities for treating such cases in the open air. In the private house continuous open-air treatment can, in the majority of cases, be instituted with little inconvenience to other members of the household. Despite this there is frequently great reluctance on the part of parents to expose their stricken child to the cold air, and perhaps this reluctance could be largely overcome if the practitioner in attendance felt more strongly convinced of the great value of this harmless and easily applied remedy.

In this investigation the mortality rate only has been considered and no mention is made of the effect of an open-air regime on the duration of the fever or the incidence of complications. These questions and certain others are at present being investigated; nevertheless the actual mortality from pneumonia must remain the vital issue when judging the success or failure of any method of treatment, and it is a sincere belief in the life-giving qualities of the "airs from heaven" which has prompted this paper.

Summary

The importance of open air as a therapeutic measure in acute primary pneumonia in children is emphasized, and the belief is expressed that the value of this remedy is not sufficiently appreciated at the present day.

A comparison is made between a series of cases treated according to an intensive open-air regime and a control group of cases treated by other measures.

Exposure to a moving current of cold fresh air throughout the whole febrile period is advocated in all types of pneumonia in children of all ages, and it is suggested that if this simple and harmless expedient were to supersede certain of the more meddlesome forms of therapy frequently employed the lives of many children would be saved.

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Samuel Meaker (*J. Amer. med. Ass.*, December 5, 1936, p. 1847) discusses the treatment of human sterility. He states that all recent advances are based on a better understanding of the aetiology, which in the majority of cases is not one single defect but the summation of several factors. Absolute sterility is found clinically in only 30 per cent. of cases, the remaining 70 per cent. showing only a group of factors tending to depress fertility below the threshold of conception. These factors are so rarely limited to one patient that Dr. Meaker has ceased to speak of sterility in man or woman, but only of a sterile mating. Excluding rarities he considers the following the important factors of infertility: (*a*) genital hypoplasia, the organs showing the differentiation of a girl of 10 with ovarian immaturity and imperfect or absent ovulation; (*b*) abnormal viscosity of the endocervical secretions of chemical or infective origin; (*c*) partial or complete obstruction of the Fallopian tubes; (*d*) deficient oogenesis due either to depression in ovarian or pituitary secretions. Effective treatment is assured by complete diagnostic study. Male sterility can be examined by an accurate evaluation of semen. Endocervical infections are best treated by cautery; insufflation of gas and iodized oil only relieves partial obstruction, and salpingostomy may establish patency of the tubes. Deficient oogenesis calls for the services of the endocrinologist, and whereas hypoplasia once established can benefit little, Dr. Meaker believes that herein lies an opportunity for preventive gynaecology by proper attention to menstrual behaviour and to the health of the adolescent girl.

AUDITORY NERVE SECTION IN MÉNIÈRE'S DISEASE

BY

R. RUTHERFORD, F.R.C.S.

The object of this investigation was to determine whether an accurate estimate of the depth of the internal auditory meatus from the outer table of the skull could be made before opening the skull, and if this was achieved to advocate the division of the eighth nerve when indicated through an operating endoscope in much the same way as one would use a cystoscope in the urinary bladder, thus reducing operative trauma to a minimum. If a suitable endoscope could not be devised it was thought that it might be possible to slip a flat graduated retractor into the subdural space, and when the calculated depth was reached to retract gently and find the foramen at once.

Preliminary Investigations

A preliminary investigation was made at the Museum of the Royal College of Surgeons, some fifty Egyptian and North American Indian skulls being measured with a view to finding a common factor whereby the depth could be estimated. The bi-mastoid diameter and the internal auditory meatus chord were correlated with the following results:

44	per cent.	of skulls	had the factor	2.6
16	,,	,,	,,	2.5
12	,,	,,	,,	2.3
8	,,	,,	,,	2.1
6	,,	,,	,,	2.8
6	,,	,,	,,	2.2
4	,,	,,	,,	2.4
2	,,	,,	,,	3.0
2	,,	,,	,,	2.9

In the above measurements the point taken on the mastoid process was situated at the upper and posterior part in the same horizontal plane as the internal auditory meatus. From the point of view of a consistent factor, and the difficulty of deciding which point on the mastoid process should be taken since the internal auditory meatus in the intact skull is invisible, the above factors have no practical value.

Other tentative measurements were made, and it was found that when one pair of supra-orbital notches was present the distance between each notch corresponded in the majority of cases with the distance between each internal auditory meatus; this was even true of the artificially deformed skulls of the North American Indians, these being flattened from before backwards and from above downwards, so that the bi-mastoid diameter is widened. The latter measurements, it was felt, did not lend any practical assistance because of the absence of one or both supra-orbital notches in a small percentage of skulls.

Dr. G. M. Morant, lecturer on anthropometry at University College, London, very kindly made a full statistical inquiry on a large number of English skulls at his disposal (100 male and 100 female). He found that an accurate estimate of the depth of the internal auditory meatus could be made from an external measurement, that external measurement being the distance between the asterion and the auriculare. To use his own words: "Taking all measurements in millimetres, the required asterion–internal auditory meatus chord is obtained by multiplying the determined asterion–auriculare chord by 0.581 and adding 26.33. So that the equation, which can be applied to either sex and to either side, is:

Asterion–internal auditory meatus = 26.33 + 0.581 asterion–auriculare."

Dr. Morant has compiled complete tables for the distances required for different values of the asterion–auriculare chord, so that in practice these tables would be used and calculation would be unnecessary.

Surgical Anatomy

The posterior cranial fossa is bounded above by the tentorium cerebelli, anteriorly by the posterior surfaces of the petrous portions of the temporal bones and by the basi-sphenoid, and laterally, inferiorly, and posteriorly by the appropriate parts of the occipital bone, which is comparatively thin where it forms part of the base of the skull; the only anatomical abnormality likely to be met with is a diminution in size or entire absence of one or other lateral sinus, in which case the sinus on the opposite side is correspondingly enlarged; an emissary vein near the mastoid process may give trouble, but is readily plugged by means of a spicule of bone driven into its foramen. The normal lateral sinus runs horizontally outwards from the torcular Herophyli, and takes a sharp turn downwards at the mastoid process; it is within this angle that the trephine hole is made, so that the approach to the internal auditory meatus is straight and involves the least instrumental displacement of the cerebellum posteriorly. The internal auditory meatus lies on the posterior surface of the portion of the temporal bone near its apex, and at a depth which can be predetermined; its centre, in adult skulls, lies 5 mm. below the attached border of the tentorium cerebelli, and through it are transmitted the facial nerve, the pars intermedia, and the auditory nerve, in that order from above downwards. There is a safe distance of 10 mm. in adult skulls between the point of entry of the nerves into the meatus and the brain stem; in other words, it would be safe to sink a streamlined endoscope or flat retractor 10 mm. beyond the calculated measurement before coming in contact with the brain stem.

Physiology

If it is intended to introduce a cranioscope through a minimal opening in the posterior cranial fossa it may become necessary, owing to the limited field of vision, to identify the nerve strand seen by utilizing the fact that there is an action current in the auditory nerve when the auditory apparatus receives a physiological stimulus; it being assumed, of course, that the various manipulations are carried out under local anaesthesia, and that the cochlea is not so diseased as to be incapable of reception. A silver electrode passed down the operating tube of the cranioscope and resting on the eighth nerve, and the indifferent electrode engaging at the back of the neck, would suffice, when the sound stimulus was applied, to operate a string galvanometer and put the identity of the nerve beyond doubt; this confirmation is perhaps more of academic than practical interest, as no doubt an optical instrument can be devised to take in the whole field of the internal auditory meatus, and identify the structures in their anatomical relations.

Operation

A female, aged 65 years, a classical case of Ménière's disease, was referred to me for operation.

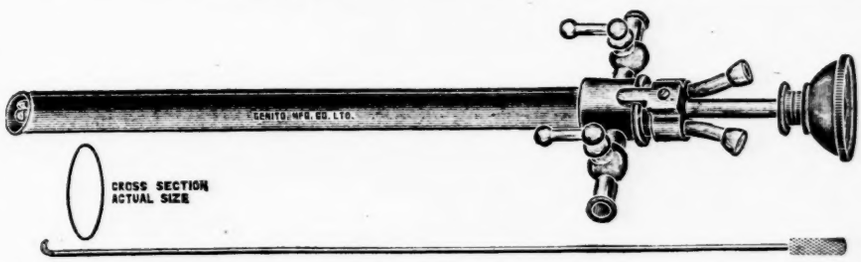
An obstetric dose of avertin was supplemented by ether inhalation. One and a half ounces of ether were used during the one and three-quarter hours operating time.

A flat malleable retractor was marked, the distance between the tip and the mark being the distance between the internal auditory meatus and the postero-superior border of the mastoid process of a prepared skull.

A transverse incision was made, stretching from the upper part of the posterior border of the mastoid process, slightly curved, with the convexity of the curve upwards, and going down immediately to bone and finishing at the external occipital protuberance. The muscles attached to the base of the skull were elevated, and a half-inch trephine hole was made about the centre of the right half of the occipital bone; this hole was carefully enlarged by nibbling forceps forwards to the posterior edge of the right lateral sinus, and upwards to the tentorial attachment, the extent of the opening being two inches in lateral extent and one and a half inches in antero-posterior extent. The bleeding from the scalp was controlled by immediate ligature, as the orthodox scalp forceps were found to be too cumbersome during the subsequent steps of the operation. The only troublesome bleeding from bone was that from the mastoid emissary vein, and this was easily controlled by a spicule of bone thrust into the foramen. The dura mater was next incised at the forward end of the skull opening, and the marked retractor slid very gently and very slowly into the subdural space until the mark was flush with the outer table; gentle traction backwards of the cerebellum immediately revealed the internal auditory meatus with the facial nerve above and the auditory nerve below; the latter was divided by tenotome. The patient was not at all shocked by the operation, and the day following was able to tell us she was quite free from giddiness and nausea, and, needless to say, was stone deaf on that side. She developed suppurative parotitis ten days following the operation, and succumbed on the fourteenth day.

The Suggested Cranioscope

With the kind collaboration of the Genito-Urinary Manufacturing Company, Ltd., an operating endoscope has been devised; the telescope and lamp are contained in an oval sheath with the "long end" tapered and still maintaining the oval section. The cross-section of the sheath is approximately 1/2 in. by 3/16 in. The central portion of the lumen is occupied by the telescope and lamp, leaving good-sized irrigation channels on either side. In the sheath the irrigating channels are large enough to accommodate the small hook knife without the latter interfering much with the flow of the irrigating fluid. The sheath is marked out in millimetres on the ventral surface, zero starting at the lens system and the distance between the lens system and the "long end" being no more than 10 mm. to avoid pressure on the brain stem. The attached illustration does not show the subsequently modified "long end" which would scoop out the brain tissue when introduced; the incorporation of a "long end" designed like the end of a flattened catheter obviates this.



Conclusion

The section of this paper dealing with the proposed use of a cranioscope is, I believe, original; if practicable it would seem to open up an avenue of observation on brain surface appearances in cerebral lesions in the living.

A NOTE ON THE ADRENAL CORTEX

BY

L. R. BROSTER, D.M., M.Ch., F.R.C.S.

Surgeon to Charing Cross Hospital

AND

H. W. C. VINES, M.A., M.D.

Pathologist, Charing Cross Hospital Institute of Pathology

Since the publication of *The Adrenal Cortex* (Broster and Vines) in 1933, and the endowment of a surgical research bed and fund at Charing Cross Hospital by Viscount Wakefield of Hythe, the scope of our work and material has considerably increased. This has enabled us to extend our studies into the spheres of biochemistry and psychology.

It may be recalled that we had drawn attention to the presence of a differential stain—the Ponceau fuchsine stain—in the cells of the adrenal cortex in our patients with virilism who had been subjected to the operation of unilateral adrenalectomy. This stain has been corroborated by others, who have shown, what we then surmised but now have also substantiated, that the stain is positive in the cortex of both adrenal glands. In a leading article following our publication it was suggested by the *British Medical Journal* that "the substance so staining must be closely related to or even identical with the male hormone or its precursor." We have now been working in this direction for some years, and consider it a matter of sufficient importance and of general interest to issue a preliminary note, and to state that we have been successful in detecting not only an androgenic principle in the urine of these patients but in isolating a new biochemical compound, specific to virilism, of adrenal origin. An important corollary to these investigations is the fact that there is a diminution in both the androgenic principle and of this new specific substance immediately after unilateral adrenalectomy.

Biochemical Investigations

Only a short abstract of each biochemical investigation is here included, since it is proposed to issue a second report on this work giving the full details.

The following is a report from Dr. Jocelyn Patterson of Charing Cross Hospital and Dr. Alan W. Greenwood of the Institute of Animal Genetics, University of Edinburgh:

Case J. K.: (*a*) Pre-operative.
(*b*) Post-operative.

"Investigations have been made of the 'free' male hormone (androgenic substance extracted from the urine without drastic hydrolysis) and 'bound' hormone (extractable only after drastic hydrolysis) with the following results:

"(*a*) Pre-operative findings:
Free hormone, 8 international units.
Bound hormone, not estimated because at the time our attention was focused entirely on the free hormone.

"(*b*) Post-operative findings:
Free hormone, 3 international units.
Bound hormone, 6 international units.

"In the normal female urine the free hormone is entirely absent, but with regard to the bound hormone we have as yet insufficient data to indicate the normal range.

"The capon method has been used for assay, androsterone being taken as the standard for comparison (1 mg. = 10 international units). It will be appreciated that in the present state of our knowledge the figures are only of relative significance, but they suffice to show that the immediate effect of the operation is to cause an appreciable drop in the excretion of free male hormone, though it has not brought about its complete disappearance from the urine."

The following samples of urine were collected at Charing Cross Hospital, evaporated to a thick syrup, and dispatched to Professor G. F. Marrian and Mr. G. Butler of the University of Toronto:

Case J. K.: (*a*) Pre-operative, 6 litres collected over ten days.
Case J. K.: (*b*) Post-operative, 2½ litres.
Case M. M.: (*c*) Pre-operative, 6 litres collected over eight days.

Professor Marrian and Mr. Butler report as follows.

"The ether-soluble neutral fractions of both pre-operative samples of urine yielded a white crystalline substance which after repeated crystallization melted at 243–244°. Yields of 242 and 95 mg. of the unpurified substance were obtained from the concentrates (*a*) and (*c*) respectively. Acid hydrolysis of the urine concentrates did not increase the yield. The post-operative urine sample from J. K. contained only a trace of this compound. We have, in the course of other work in this laboratory, examined a large number of urine samples collected from normal men and pregnant and non-pregnant women, but we have never been able to demonstrate the presence of this new compound in such urines. It would appear, therefore, to be specific to virilism of adrenal origin.

"This crystalline compound analyses sharply for the formula $C_{21}H_{36}O_3$. It appears to contain one tertiary and two secondary hydroxyl groups. The main features of the constitution of this interesting compound have been elucidated and will shortly be published by us elsewhere. It seems possible that the new compound is closely related to the series of compounds isolated by several groups of workers from adrenal tissues."

The Adreno-genital Syndrome and Sexuality

Dr. Clifford Allen has established the fact that the adreno-genital syndrome may influence sexuality to a profound degree. A large percentage of the patients showing this syndrome also show sexual abnormalities, being mainly homosexual or having diminished heterosexuality. Operation may influence this enormously. Patients suffering from the adreno-genital syndrome who showed strong homosexuality have been changed to strong heterosexuality and those with diminished heterosexuality have had it restored to normality. It has been determined definitely that there are two types of homosexuality, one dependent on disease of the glands (the adrenal glands in the cases studied), and the other on psychical disease. Operation cures the former but not the latter, which may respond to psychotherapy. These studies demonstrate the relation between psychical and physical sexuality in a way which has not been possible before.

Conclusion

This advance places the surgery of the adrenal cortex on a par—as one would expect—with the other glands of the endocrine series—namely, that a hypersecretion of the two glands can be controlled by means of the removal of one, and that there is as yet no evidence that the remaining gland hypertrophies sufficiently to cause a return of the clinical condition.

Clinical Memoranda

Psychosis Associated with Atropine Administration

The case is that of a man of 44 years, unmarried, who had been working as a labourer in Australia for many years.

The following history was given. There had been no previous serious ill-health, but for some years he had been troubled with his eyes. A few weeks after landing in England he consulted an ophthalmologist, who diagnosed chronic glaucoma, and he was admitted to hospital. On the day after admission the right eye was trephined with complete iridectomy, and an atropine solution was used to wash out the eye. Three days later the patient became confused and restless, screaming and getting in and out of bed. He believed that people were going to injure him, and would not tolerate anyone near him. Morphine, 1/4 grain, and hyoscine, 1/100 grain, were given but had little effect, and it was said that his delusions and hallucinations became more vivid. He believed the nurses were going to nail him to a board and burn him. He was transferred to Smithdown Road Hospital, Liverpool, and admitted to the special division on an order for temporary detention completed by a relieving officer.

On examination he persisted in his persecutory delusions with regard to the last hospital and amplified them. He said he had been given poisoned food, that he had feared to go to sleep as they were waiting to kill him, etc., but that he had had no trouble since leaving there. He was restless and excited. The left pupil was dilated and inactive and the hands were tremulous. Pulse rate was 130, and the tongue was dry and coated. There was no evidence of lesion of the central nervous system.

The same day he was seen by the visiting ophthalmologist, Mr. Broderick, who prescribed boric lotion for the right eye and guttae pilocarpinae 1 per cent. for the left eye. The patient improved somewhat during the day, becoming more composed and amenable.

The following morning atropine, 1/100 grain, was injected subcutaneously. One and a half hours later the pulse rate increased and the left pupil was widely dilated. The patient would not allow the doctor to come near him, saying that the latter had come to destroy him. He was confused and disorientated as to time and place, refused food, and struck out at imaginary persons. Two c.cm. prostigmine were given, and two hours later the pulse rate was 90 and the left pupil reduced in size. The patient said he had been imagining things. He took food well, and later slept satisfactorily.

The next day the pupil was again dilated and the pulse 120. He was tremulous and incoherent, and made rambling statements about being burned to death because of his past sins, and said that the whole ward was against him. Two c.cm. prostigmine were again given. The left pupil contracted within one hour and the patient became calmer. He said that his troubles were due to imagination. He complained of his eyes aching, but had no dryness of the mouth. Micturition and bowel action were normal. He said that at the previous hospital he had had pain in the eyes after each instillation of the drops, and he ascribed all his troubles to the operation.

There was no return of the delusions. His emotional state became steadily more stable, behaviour was normal, and he was co-operative in the ordinary routine of the hospital. The blood Wassermann test was negative. He was discharged from the hospital twenty-two days after the date of admission, arrangements having been made for further post-operative treatment of the right eye.

COMMENTARY

We are told by ophthalmologists that mental disturbance following eye operations and delirious states associated with atropine administration are not uncommon. During the past five years no such cases have been admitted to the mental observation wards serving the area under the administration of the Liverpool Corporation. The cases that do occur are no doubt very transient as a rule or of a degree that is manageable under ordinary hospital or home conditions. Recent literature, in this country at least, reveals few apposite references, and it was thought worth while to put this case on record.

The amount of atropine absorbed by this patient is unknown, but it will be noted that a history was given of the eye being "washed out" with atropine solution for three days before the onset of mental disturbance. This drug being one to which individual susceptibility is very variable, it must be considered that in this case there was an idiosyncrasy.

The clinical picture showed many points of similarity to delirium tremens. There was no definite indication that the condition was a reaction to atropine, and an injection of this drug was given to clarify the point, in the knowledge that if atropine were the exciting cause its effects could be rapidly countered. It would have been interesting to observe, however, the duration of the mental disturbance in the absence of any medicinal measures. The history obtained showed no evidence of abnormality of personality before the present mental disturbance, but the fact that the patient had so recently arrived in England and no previous associates were known prevented an adequate assessment of this factor.

We are indebted to Dr. J. P. Steel, medical superintendent of the hospital, for permission to publish this case.

F. HOPKINS,
Consulting Psychiatrist,
Liverpool. J. ROBYNS-JONES,
Resident Medical Officer, Smithdown Road Hospital.

Bilharzial Invasion of Appendix

I think the following case is worthy of being recorded.

A European miner aged 28 was seen at midday. He complained of an acute attack of pain in the right lower abdomen at 8 a.m., with pain radiating down the right leg, which felt lame. He had vomited once.

On examination classical signs of acute appendicitis were elicited—pain on pressure over McBurney's point, rigidity of right lower rectus with absent right lower abdominal reflex, cutaneous hyperaesthesia over right lower abdomen, and with pain on pressure over left lower abdomen referred to the right side. He also gave a positive Cope's obturator test. Temperature 96.2°; pulse 80.

I performed an emergency appendicectomy and found that the appendix, which was slightly inflamed and not adherent to any intra-abdominal organ, presented on its distal end a swelling the size of a hazel nut. As I suspected this "lump" to be a neoplasm I sent the appendix to the South African Institute for Medical Research for histological investigation. The following report was subsequently received: "Section of this appendix (nodule at extremity) showed the presence of chronic inflammation and fibrosis in response to a heavy deposit of bilharzial ova. There is no evidence of neoplasia."

I made a careful investigation into this patient's history, but could get no evidence of bilharzial bladder infection. He had never had pain in the bladder, difficulty with micturition, nor had he ever passed blood in the urine.

Examination of the faeces by direct and concentration methods detected no bilharzial ova, but dead and living ova of *Schistosoma haematobium* were present in the urine.

The patient made an uninterrupted recovery after the operation, and at the end of a heavy course of a proprietary antimony preparation returned a negative test for bilharzia ova in the urine.

R. M. SARGENT, B.Sc., M.B., B.S.Lond.
Benoni, Transvaal.

Reviews

A DOCTOR IN PEACE AND WAR

Scalpel and Sword. By Sir James Elliott, M.D. (Pp. 215. 7s. 6d.) London: Angus and Robertson. Dunedin and Wellington: A. H. and A. W. Reed. 1937.

Few have deserved a knighthood better than Sir James Elliott. He is a past-president of the New Zealand Branch of the British Medical Association, consulting surgeon to the Wellington Hospital, and a member of the New Zealand Board of Health. During the fifty years he has lived in Wellington he has seen it grow from little more than a small settlement with primitive habits and manners to a fine city, and in its growth he has had an important share. The first chapters of his *Scalpel and Sword* will give great pleasure to the older inhabitants, for it must recall to them many conditions with which they were familiar in their younger days. As a student at Otago Sir James has many stories of the University staff and of their peculiarities, for it is evident that some of the professors were "characters." We should like to hear more of Tom Parker, whom Huxley taught at the School of Mines, then located at the very top of a high building adjoining the South Kensington Museum. Parker carried with him the Huxleian tradition to Otago. Did he also carry with him the insatiable curiosity which was so marked a feature of his student career? From Otago James Elliott proceeded to Edinburgh, and before he qualified went to South Africa as a member of the V.M.S.C., doing such good work as a dresser that he was awarded the Queen's medal with two clasps. Of this campaign, its mistakes, and merits he gives a most interesting account. After returning to Edinburgh to take his M.B. he soon went home, and was engaged in practice until the great war began, when he again volunteered, receiving a commission as lieutenant-colonel in the N.Z.M.C. and becoming A.D.M.S. Central Command, N.Z. Of this period he says little, but confines himself to his experiences on the New Zealand hospital ship *Maheno*, experience which should be of service to every medical officer in case of any future war.

Sir James enlivens his story with many anecdotes and witty sayings, some new and some old. The book concludes with a chapter on "Roving in Maoriland," which we would gladly exchange for more reminiscences. It may be noted that the volume is set up, printed, and bound by the Halstead Printing Company of Sydney, and can be obtained in London from the Australian Book Company, 37, Great Russell Street, W.C.1. The publishers, Messrs. A. H. and A. W. Reed of Dunedin and Wellington, are to be as heartily congratulated on the technical result as is the author. The type and binding are excellent and the contents most readable.

A SURGICAL BOOK FOR STUDENTS OF DENTISTRY

Surgery for Dental Students. By Philip H. Mitchiner, M.D., M.S., F.R.C.S., Clement E. Shattock, M.D., M.S., F.R.C.S., Edward G. Slesinger, O.B.E., M.S., F.R.C.S. and Cecil P. G. Wakeley, D.Sc., F.R.C.S. (Pp. 364; 105 figures. 12s. 6d.) London: Baillière, Tindall and Cox. 1936.

In writing this manual the authors have essayed the difficult task of "providing the dental surgeon with a work to which he can refer for practical guidance, and the student with a textbook containing the knowledge he will be expected by his examiners to possess." In particular, they aim at covering the syllabus in surgery and surgical pathology of the Royal Colleges of Surgeons of England, Scotland, and Ireland, and of the universities of the British Empire.

Frankly we do not think the authors have been able to combine the two objectives. As members of the examining board in dental surgery of the Royal College of Surgeons of England they introduce and illustrate such conditions as fractures of long bones, tuberculous dislocation of the hip, sarcoma of the breast, sacculated aneurysm, filling the book with descriptions of subjects which, however useful for examination purposes, will never come into the dental surgeon's hands. On the other hand, the dental cyst, which is the commonest "surgical" affection the dentist sees, receives scant attention and is illustrated by the figure of a dentigerous cyst. The book suffers from a common fault of a joint work by several hands—repetition. It closes with a carefully considered chapter on anaesthetics by Dr. A. D. Marston.

The authors are concise and clear in all their descriptions of disease and treatment—our criticism is really a criticism of the surgical syllabus of the various corporations and universities which issue dental qualifications.

SURGERY OF THE CHEST AND ABDOMEN

The Operations of Surgery. Vol. 2. The Abdomen. By R. P. Rowlands, M.S., F.R.C.S., and Philip Turner, B.Sc., M.S., F.R.C.S. (Pp. 998; 514 figures, 4 in colour. 36s.) London: J. and A. Churchill. 1937.

The second volume of the eighth edition of this well-known work deals with surgery of the chest and abdomen. In its preparation Mr. Philip Turner has secured from among his colleagues at Guy's Hospital the collaboration of Messrs. Ralph Thompson, G. F. Gibberd, and R. C. Brock, who write on their specialties of genito-urinary surgery, gynaecology, and thoracic surgery respectively, and of Mr. W. H. Ogilvie, who writes on hernia and on the spleen and pancreas, anus and rectum, and on the preparation of the patient for operation. At the end of the present volume a new chapter on some recent developments has been added. This is an attractive feature, and it might with advantage be amplified in future editions. In this section we are pleased to find a summary of Professor Grey Turner's important work on oesophageal resection. We should like to have seen some reference to the management of brain abscess by the method of Clovis-Vincent (which in our opinion surpasses those methods referred to), and some mention of the dehydration treatment of cases of head injury and of cerebral oedema. Where space is limited, however, the choice of what to add on new methods must always be difficult. There appears to have been more complete revision in volume 1 than in volume 2 of this edition, and we hope that in future still further pruning will be done; a series of illustrations of the methods of carrying out gastropexy is surely only of historical interest to-day.

The text is clear throughout and the descriptions are precise and easily followed. The allusions to the history of certain operations are pleasing and the discussions of the indications for operations particularly valuable. In this respect the chapter on appendicitis is one of the best in the book. The volume is dedicated to Guy's Hospital, and we welcome it and its companion in this edition as a worthy successor to the original *Operations of Surgery* by W. H. A. Jacobson, which first appeared in 1889. The many references to the surgical staff of Guy's will appeal particularly to Guy's men, but the work as a whole will prove a useful guide to any young surgeon who is confronted with problems relating to operative surgery.

THE MANTLE OF WHITRIDGE WILLIAMS

Williams' Obstetrics. By Henricus J. Stander, M.D., F.A.C.S. Seventh edition. (Pp. 1,269; 729 figures. 40s. net.) London: D. Appleton-Century Co. 1936.

Dr. J. Whitridge Williams died in 1931, a year after he had completed the thoroughly revised sixth edition of his *Obstetrics*, and so passed the doyen of obstetrics in the English-speaking world. It is fortunate that the publishers were able to secure the services of Dr. H. J. Stander to bring out the seventh edition, for of all men he is the most likely to safeguard the traditions of his teacher's masterpiece. This edition follows closely the lines of the former, but there has been some rearrangement of chapters, together with the addition of fresh illustrations. Further, three new chapters have been added, dealing with the hormones related to pregnancy and the puerperium; the urinary complications of pregnancy; and analgesia and anaesthesia in labour. It suffices to say that the style and manner of presentation of the matter in these new chapters is worthy of the book, and indeed the section on the hormones is one of the best and most succinct presentations of the subject of which we are aware. A few typographical errors have escaped detection.

There is no need to recommend a book so well known. It possesses a breadth of vision, an almost Olympian attitude towards the subject, that places it above the arena of controversy. In spite of its great erudition, it indicates a practical, conservative, and dependable line of treatment for every obstetric emergency. *Williams' Obstetrics* has been, by common consent, for many years the outstanding book on the subject in the English language, and it would be difficult to find its equal in any language. The mantle of Whitridge Williams has fallen on Stander, and there seems no reason why this book should not retain its unique position for another generation.

LEPROSY IN THE CHINESE

Leprosy. A Practical Text-Book for Use in China. By James L. Maxwell, M.D. (Pp. 109; 2 dollars (China); 4s. abroad.) Shanghai: Chinese Medical Association. 1937.

Such a book as this by Dr. James Maxwell is a sign of the greatly increased interest taken in leprosy during recent years. New knowledge stresses the great variations in the type of leprosy cases observed in different countries of the world and in different races, and as this small work is illustrated by good photographs of both early and late stages of the different types of leprosy in Chinese subjects it should fulfil the object of the author in providing a simple and practical book for use in the vast leprosy areas of China.

The author has collected much information regarding the distribution of the disease, which shows the highest rates of incidence in the southern and south-western provinces and in Shangtung in the north-east, quite irrespective of race or climate. The symptoms and lesions are clearly described, the Philippine Congress classification being adopted, in spite of part of it being based in some degree on microscopical characters of the lesions, making it unsuitable for Chinese conditions. The author rightly stresses the primary importance of attention to the general health and the complicating debilitating diseases of the patients, and also to an adequate diet, including abundant calcium. The best methods of administering the usual chaulmoogra oil preparations are described, and their value in early and in some of the more advanced cases is recognized. The final chapter, on village clinics and leper settlements, is of special interest on account of the author's extensive experience in visiting the institutions of various mission bodies in China. He points out that settlements tend to keep alive hopeless and often uninfective cases at great cost, and he advocates numerous village clinics for the economical treatment of early cases, with visits to the patients' homes to advise and detect early cases, as by far the most effective prophylactic method. This book should prove of value beyond the limits of China.

INDECENT PUBLICATIONS

Obscene Literature. In Law and Practice. By Sir E. Tindal Atkinson, K.C.B., C.B.E. (Pp. 32. 1s. net.) London: Christophers. 1937.

At common law it has long been an offence to publish indecent books or prints. The test of obscenity, as laid down in R. *v.* Hicklin (1868, L.R. 3 Q.B., 367), is whether the tendency of the matter published is to deprave and corrupt those whose minds are open to such immoral influences and into whose hands the publication might fall. Sir Edward Tindal Atkinson, Director of Public Prosecutions, recently delivered a most valuable lecture in which he dealt with the whole of the law of obscene literature, and he has now reprinted it as a pamphlet; it contains matter that will interest everyone in these times of insistence on extreme licence in literature. It is obvious, as he says, that the standard must be a shifting one, and that many books now published without comment would have been condemned in 1868. The offence is, of course, a statutory as well as a common law one. The Vagrancy Act, 1824, s. 4, lays down that a person who wilfully exposes to view in a street or public place any obscene print or picture is a rogue and a vagabond, and the amending Act of 1838 included exhibitions in shop windows. Other Acts more or less repeat these provisions, and the Public Health Acts (Amendment) Act, 1907, s. 81, makes it an offence to do any of these things in any place of public resort or unfenced ground abutting on a street. The Obscene Publications Act, 1857, is the Act which the police chiefly use in restraining the activities of small shopkeepers who sell indecent postcards as a side-line. A police officer has to swear before a magistrate that he believes that obscene prints are kept on the premises and that there actually has been a sale or publication there.

From the medical point of view this branch of the law is particularly interesting in its application to scientific or pseudo-scientific works. The judge who tried Hicklin's case pointed out that a medical treatise with illustrations necessary for the information of students or practitioners would probably not be treated as obscene if published so as to reach only such persons, though it might be if exhibited in a shop window for any passer-by to see. A far more difficult problem is presented by two classes of literature mentioned by Sir Edward Tindal Atkinson, the publication of which has much increased during the past two years. These comprise books which, while masquerading under the guise of scientific works, purport in extreme detail to lay before the public the subject of sexual relations and aberrations; and books which, under the guise of literature, use sexual matters as colours in making a picture, generally of modern life, to such exclusion of other elements as to put sex in a wholly disproportionate and false position. In the first place, he says, the publishers' announcements pay lip-service to the cause of science, and in the second class the books range from purely and obviously pornographic works to novels in which, for the purpose of adding to their selling value,

semi-indecent passages are purposely introduced. Medical men will at once call to mind examples, and probably will not be concerned to defend a publication which is more or less obviously designed to appeal to the unscientific interest of the public rather than to the scientific interest of the student. As Sir Edward Tindal Atkinson said once in a memorandum on one of these cases, much of the detail in the book could justifiably find a place in a medical or historical work, but it did not pretend to have any serious purpose, and it also illustrated the contention that the greater the ability with which the indecent picture is presented the greater is the danger to the mind of the reader.

Even in these days there is no reason to doubt that many minds can be corrupted by disturbance of what the psychologist might term the "sexual balance." Whether a particular book transgresses or not is always a difficult question, but few will disagree with the author's view that the number of cases in which art, literature, and science have really been aggrieved by the condemnation of a book is remarkably small.

PREVENTIVE MEDICINE

Preventive Medicine. By Mark F. Boyd, M.D., M.S. Fifth edition, reset. (Pp. 561; 155 figures. 20s. net.) Philadelphia and London: W. B. Saunders Co. 1936.

The new edition of Dr. Mark Boyd's book contains a good deal of new material. Of the enlarged articles that on diphtheria refers to the administration of the alum-precipitated toxoid for the purpose of active immunization. It is stated that the occurrence of local reactions in about 5 per cent. of older children and adults is largely limiting the use of present-day preparations to children under 6, in whom the one-dose method, subject to conditions, is sanctioned by current practice. In the article on encephalitis this disease is classified, in accordance with a recent bulletin of the United States Public Health Service, into: (1) lethargic; (2) epidemic, including the Japanese and St. Louis forms; (3) other infectious types; and (4) the post-infectious forms, such as post-vaccinial encephalitis. In the article on poliomyelitis it is well said with regard to the various methods claimed to produce immunization that judgement of their value must be deferred. In the article on malaria the uses of plasmoquine and atebrin respectively are adequately discussed. Among other new or enlarged articles are those on ringworm, psittacosis, tuberculosis, typhus, relapsing fever, and mottled enamel of the teeth. This dental dystrophy, which occurs among children in communities using deep wells in certain States of the Union, is now known to be due to the presence of fluorine in the water. The morbific proportion of fluorine is given as 0.9 part upwards per million of water.

The fifth edition of this work, like its predecessors, presents a lucid exposition of the views held in the United States on the subject with which it deals.

Notes on Books

The *Transactions of the Ophthalmological Society*, vol. 56, is a volume of 442 pages, with numerous diagrams and eight plates, five of which are coloured. The contributions are grouped under subjects, and cover the whole field of ophthalmology. Among the many interesting communications is a discussion on ophthalmia neonatorum, and papers on a "Talking Book for the Blind," and "The Aetiology of Phlyctenular Ophthalmia." The last 120 pages contain the reports of the affiliated societies. There is a useful index of authors and subjects.

The 1937 issue of the *Municipal Year Book and Encyclopaedia of Local Government Administration* is a large volume of 1,676 pages, and comprises altogether fifty sections. Apart from its general utility in many directions it affords a permanent record of the salient events in local government during the past year. The Minister of Health again contributes a preface, and the Minister of Transport a foreword to the roads and transport section. Fifty pages of the new edition are devoted to a concise survey of the outstanding developments in local government in 1936. There is a comprehensive review of recent local government legislation, followed by a digest of leading law cases of 1936. Statistical tables attached to many of the sections give the latest figures relating to local government services, and these are indispensable for comparative purposes. In the directory part of the book the descriptive material concerning local authorities has been revised and brought up to date. This well-produced volume, with its handy thumb index, is one of the most complete and satisfactory reference books with which we are acquainted. It is published at 30s. by the Municipal Journal, Ltd., 3 and 4, Clement's Inn, Strand, London, W.C.2.

Clio Medica is a series of primers on the history of medicine, edited by Dr. E. A. Krumbhaar and published by the firm of Paul B. Hoeber, which now forms the medical book department of Harper Bros. of New York. *Greek Medicine* is the eighteenth volume of the series (price 2 dollars) and has been entrusted to the very capable hands of Dr. FRED B. LUND of Boston, Mass. It deals with Greek medicine from Hippocrates to Oribasius, and Dr. Lund has wisely fitted himself for the task by rereading in the originals the various writers so far as their works are still available. He has thus made an interesting volume, for instead of a barren account of sects and methods he tells of the men themselves and what each did to advance knowledge. Greek medicine forms the basis of all modern medicine. The clear thinking and careful observation of facts often brought the Greek writers very near to modern knowledge of disease. Advances in chemistry, in physics, and the invention of the compound microscope have in many cases enabled us to demonstrate what they could only surmise. Dr. Lund points out that as Greek is no longer compulsory in schools the Greek medical writers will not attract much attention in the future. But in England and in the United States there are still a number of scholarly physicians and surgeons who will heartily welcome this little volume of 154 pages with seven whole-page illustrations.

Preparations and Appliances

SOLUSEPTASINE

Soluseptasine—made by Pharmaceutical Specialities (May and Baker) Ltd.—is a 5 per cent. solution of disodium (γ-phenylpropylamino) benzene sulphonamide-α-γ-disulphonate. The discovery that a group of compounds containing aminobenzene-sulphonamide act as effective chemotherapeutic agents in streptococcal infections is one of the most remarkable advances recently made in therapeutics. Messrs. May and Baker introduced proseptasine (benzyl-aminobenzene sulphonamide) for oral use and have now prepared this new compound, which is suitable for either intramuscular or intravenous injection. It is only recently that the chemotherapeutic action of this group of drugs has been discovered; knowledge of its possibilities and limitations is still imperfect, and so also is knowledge regarding the optimum dosage and form of administration. Messrs. May and Baker state that clinical trials are proceeding with their new compound.

A LIVER PREPARATION

"Orheptal" (E. Merck, Darmstadt) is a preparation for oral administration which contains concentrated liver extract with salts of iron, copper, and manganese, glycophosphates, caffeine, quinine, tinctures of nux vomica, gentian, absinthe, and orange peel, together with a few other ingredients.

THE EVIDENCE FOR COMPULSORY PASTEURIZATION OF MILK

BY

C. FRASER BROCKINGTON, M.D.

Medical Officer of Health, Horsham and Petworth Combined Districts

For many reasons the popularity and consumption of milk are on the increase, so that the time has come for the medical profession in general and health authorities in particular to take stock of their position in this matter. Milk is the vehicle for carrying many unpalatable things: farm dirt, cow manure, filth from milkers' hands, dirt from vessels, as well as other things not unpalatable but often disastrous to man, such as *Brucella abortus*, Koch's tubercle bacillus, and the organisms of enteric fever. There is a school of thought which believes that we must all swallow "a peck of dirt before we die." This should be a consolation to the many who are forced to drink milk with admixture of manure in varying strength, and until the far-off day when all milking will be mechanically performed, with conveyance direct from the cow into sealed sterilized bottles, it seems reasonably certain that milk will continue to contain dirt.

For this there are two reasons: first, that milking-cows are most difficult animals to keep clean, since they produce great quantities of liquid manure; and, secondly, that the milker is a poorly paid worker to whom cleansing of udders and washing of hands are irksome matters, generally inadequately performed. There can be no question that efforts by sanitary authorities to improve the cleanliness of milk production under the various Orders and Regulations evolved by the Ministry of Health have brought about great improvements, and to-day the production of milk is very much more cleanly than a decade ago. Yet they have done little more than remedy gross abuses; the day is far removed when cows will be groomed like horses. However, if it is as yet impossible to ensure that the community shall consume milk free from dirt, there can be no convincing argument in favour of continuing to allow this milk to carry live pathogenic organisms. Very few will now welcome tuberculous milk for its immunizing properties. Vaccination by a method so crude that many succumb to the immunizing dose should find little support in the scientific world of to-day, where any form of immunization with an equal number of fatalities would instantly be abandoned.

Pathogenic Organisms Derived from the Cow

Pathogenic organisms may gain entrance to milk before and after it leaves the cow. In the first group are those arising from cattle infections, the chief organisms being bovine tubercle bacilli, *Brucella abortus*, and streptococci from mastitis. The incidence of bovine tuberculosis in children, as meningitis, cervical adenitis, and lesions of the bones and joints, has been estimated by various workers. Dr. Stanley Griffith (1934) cultured material from the meninges of 214 cases of tuberculous meningitis. In this series, combining results from England and Scotland, 24.3 per cent. proved to be of bovine origin. In England the amount is somewhat lower at 21.8 per cent. and in Scotland considerably higher at 40.5 per cent. Since pasteurization of milk is very much more extensively employed in towns and cities, and the above figures include the excess of infections due to the human bacillus occurring in towns, it is probable that the percentage incidence of bovine meningitis in country districts of England is even higher. In support of this there are Griffith's thirty-three cases from the county of Kent, of which 33 per cent. were found to be bovine in origin. It is significant also that during the first year of life only 15 per cent. were bovine, since cows' milk is more commonly heated when given to babies than to children of higher ages.

The incidence of bovine tuberculosis in cervical glands appears to be greater than that in the meninges. In England Griffith (1929) found 45.7 per cent. of cases (fifty-three out of 116) to be due to the bovine type. In Scotland the proportion is even higher, Mitchell (1914) in Edinburgh finding 88 per cent. and Blacklock (1932) in Glasgow 64.3 per cent. of cases (eighteen out of twenty-eight) of bovine origin. There is, again, a difference between country and town children, for Blacklock remarks "a striking fact that of the twenty-one country children in our series of cases with tuberculous cervical adenitis sixteen (76.2 per cent.) were infected with bovine strains and five with human, while of the seven city children [Blacklock refers to Glasgow, where he says 80 per cent. of the milk is pasteurized] only two (28.6 per cent.) were infected with the bovine type." Finally, in lesions of the bones and joints Blacklock (1931) found 34.6 per cent. (nine out of twenty-six) to be bovine; Griffith 20.9 per cent. (eighty-nine out of 426) in English children, and 28.6 per cent. (eight out of twenty-eight) in Scottish children. Roughly, then, for Great Britain as a whole at all ages, half to two-thirds of the cases of tuberculous cervical adenitis, one-quarter of the cases of tuberculous meningitis, and one-fifth of the cases of bone and joint tuberculosis appear to be of bovine origin.

If we now turn to undulant fever we find evidence of extensive infection of humans by *Brucella abortus* derived from milk. But, owing to the insidious nature of this fever and the difficulty in diagnosis, we have not the same wealth of statistics as are available for bovine tuberculosis. It is only within the last decade that the possibility of infections of the human with *Brucella abortus* has been largely recognized. In 1928 Dalrymple-Champneys (1934) records that only five cases were reported. In 1932, with increasing diagnosis, this number was fifty-seven. There is little doubt that the true number of infections is considerably in excess of this, possibly even ten times that number (Wilson, 1932). Dalrymple-Champneys has collected 147 cases, and reports "that 141 of these were consumers of raw milk—that is, milk which had not been boiled or pasteurized"—and he adds: "It is important to note that two of these patients drank Certified milk, three Grade A tuberculin-tested, and four Grade A." He recommends that, failing the provision of abortus-free herds, "all medical officers of schools should insist upon a pasteurized supply of milk."

There is a similar uncertainty as to the incidence of streptococcal infections resulting from mastitis, sores on the teats, and other septic infections. Such infections are not notifiable, and they go for the most part unrecorded. In America (Rosenau, 1935) between 1907 and 1923 there were seventeen outbreaks of septic sore throat with a total of 3,497 cases. Some of these may have been due to contamination of milk after it had left the cow. In English outbreaks, of which that occurring in Brighton and Hove in 1929 was a classic example, the sore throat is of varying grades of severity, and the worst cases have a variety of complications, possibly with fatal results. As another example of many such milk-borne outbreaks in England may be quoted that which occurred in August, 1935, at Chelmsford, when the number of cases of septic sore throat was of the order of 1,600 (Camps and Wood, 1936).

The Extent of the Danger

The situation thus revealed as to the incidence in England of these three cattle infections is serious. *Brucella abortus* and the haemolytic streptococcus, to an extent at present impossible to estimate, swell the reservoir of undiagnosed and undiagnosable fevers, and the bovine tubercle bacillus causes the deaths of four times as many children as scarlet fever and over half as many as diphtheria. The percentage of cattle infected is clearly very high. The number infected with tuberculosis has been variously placed at between 40 and 70 per cent. It is not clear how many of these are actually excreting tubercle bacilli in the milk, or in the

faeces which subsequently contaminates the milk, but in Manchester in 1929 9.8 per cent. of milk samples were found to contain virulent bacilli, and of samples from 697 farms sending milk into Manchester eighty-eight (12.63 per cent.) gave positive results (Ministry of Health Report, 1931). Dalrymple-Champneys (1934) has said that "experienced veterinarians are agreed that something like 80 per cent. of our milk herds are infected with *Brucella abortus*, and that most, if not all, infected cows excrete this organism in their milk at some time during their infection, which is usually long." The incidence of mastitis is extremely high and affects even the herds producing graded milk. For example, Pullinger (1935) found that milk from ten out of twelve herds producing certified milk and twelve out of fourteen herds producing Grade A tuberculin-tested milk contained mastitis streptococci when examined at intervals over a period of fifteen months. In short, it would probably be no exaggeration to say that three-quarters of the cattle in England would at any one time be found to be excreting one, two, or even three of these organisms in virulent form.

The removal of such extensive infection seems almost hopeless. Even with a State veterinary service, a carefully organized eradication campaign, control of importation and internal markets, and almost unlimited funds, any substantial progress would take long years to achieve. In the meantime tuberculosis alone among the numerous milk-borne diseases would probably cause about 2,600 deaths annually (Economic Advisory Council Report, 1934). Compare this with the dramatic results achieved in Toronto, where, following the institution of universal pasteurization in 1915, no single case of bovine tuberculosis among city children has occurred (Price, 1934).

Pathogenic Organisms Not Derived from the Cow

In the second group of pathogenic organisms contaminating milk are those which may gain entrance to milk *after* it has left the cow; these are usually of human origin. The opportunities for contamination of milk are abundant—at the time of milking, in the dairy, during transportation, or in the household—and milk may, in addition, be contaminated by flies. There is no doubt that in this way a great number of epidemics of enteric, cholera, dysentery, scarlet fever, diphtheria, and septic sore throat have occurred. Rosenau (1935) reports that in the United States between 1907 and 1923 there occurred seventy-eight outbreaks of typhoid fever with a total of 3,008 cases, fifteen outbreaks of scarlet fever with a total of 2,940 cases, seventeen outbreaks of septic sore throat (these were probably mainly the result of mastitis, not of contamination from outside) with a total of 3,497 cases, and seven outbreaks of diphtheria with a total of 169 cases. Rosenau adds that "since the general adoption of pasteurization for milk supplies of large cities in Massachusetts milk-borne outbreaks occur characteristically in small unpasteurized supplies." "When all these facts are brought together," he continues, "they make a strong indictment against raw milk." Indeed, there is such a wealth of data recording outbreaks of milk-borne diseases due solely to the contamination of milk after it has left the cow that the very weight of evidence serves to confuse and to suggest that that which has existed so long might be allowed to continue unchecked. If more eloquent testimony were needed than that already provided by the long list of milk-borne epidemics which have been placed on record, it is to be hoped that the recent outbreak of typhoid in Bournemouth, which for severity recalls that in Clifton in 1897 (Davies), and which was checked by pasteurization, will have served to bring the risk and the realization of the remedy clearly before the public.

There can indeed no longer be any doubt that the time for more active prevention than that yet exercised has arrived. Bovine tuberculosis is a deadly malady with a double tragedy to parent and child; undulant fever is an insidious disease often baffling to the doctor and the cause of long periods of ill-health; typhoid and other milk-borne epidemics are the more disastrous because of their suddenness and the difficulty of tracing their origin. Against all this there is a preventive as complete and absolute as is vaccination against small-pox or inoculation against diphtheria. If all milk from to-day were pasteurized there need not be one more child crippled by bovine tuberculosis. Hospital mortuaries in England would be depleted of a third, and those in Scotland of nearly one-half, their present number of victims of tuberculous meningitis; epidemics of milk-borne diseases would cease; and, finally, many persons would be saved from the debilitating effects of undulant fever. It has been said, and many would agree, that "there are only two grades of milk—raw and pasteurized: raw milk has yet to be shown fit for human consumption."

Summary

1. Milk purveyed by present methods may contain dirt and pathogenic organisms.

2. Dirt may be tolerated, but pathogenic organisms should be permitted no longer.

3. Cattle infections contaminating milk while in the udder and a variety of organisms introduced to milk later by human handling are to-day causing sickness; the amount of this has not yet been completely estimated, but it has been shown clearly by many workers to be extensive.

4. The eradication of these infections among human beings cannot be left to await a Utopian state where diseased cattle have been eliminated and all milking is mechanically performed in such a manner that external contamination is no longer possible.

5. Universal compulsory pasteurization presents the only method of preventing the spread of cattle infections and the contamination of milk by human handling.

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H. W. Willis (*J. Pediat.*, January, 1937, p. 65), who records an illustrative case, states that the majority of cases of nicotine poisoning on record are in adults. Of seventy-four fatal cases collected by Franke and Thomas (*J. Pharmacol. and exper. Ther.*, 1933) twenty-eight were from concentrated solutions of nicotine and forty-six from tobacco poisoning. Although only a few cases have been reported in children, their frequent exposure to tobacco makes it a clinical entity with which every physician should be familiar. The possibility of acute nicotine poisoning should always be considered in cases of coma of unknown cause. Treatment consists in artificial respiration and injection of adrenaline into the left ventricle. Willis's patient was a boy aged 5, who became unconscious and vomited continually immediately after an enema consisting of 60 c.cm. of strong tobacco juice in 1,000 c.cm. of water, which was given for threadworms. Recovery took place after three doses of sodium benzoate and copious enemas to eliminate the nicotine.

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THE CONTROL OF LEPROSY

It is calculated that there are at least five million sufferers from leprosy in the world. This figure is not based on accurate statistics, as in many of the countries in which it is most common vital statistics are not available. Even in India, where lepers are enumerated in the decennial census, special "sample surveys" made by expert doctors in limited areas showed that the 1921 census figures had to be multiplied five to fifteen times to give anything like a correct estimate of the incidence of the disease.

Leprosy appears to have been common in England at one time: old records dating from a period when the population was between two and four millions show the existence of over 300 lazarets. Doubtless many of the inmates of these institutions were not real lepers, but suffered from syphilis and various disfiguring cutaneous diseases. Still there seems little doubt that leprosy was once an extremely common disease, both in this country and throughout Europe, during the Middle Ages. The lazaret was primarily an almshouse, erected by charitably disposed patrons for the shelter of these unfortunate people. But about the beginning of the fourteenth century people became aware of the contagious nature of leprosy, and the leper was banished from the community. The funeral service was read over the unfortunate victim, who was thereafter counted as dead to the world and strictly forbidden to mix with his fellows. Many of these poor people were sheltered in lazarets; others wandered about the country making a precarious livelihood by begging. It is probable that the chief reason for the disappearance of leprosy as an endemic disease was this recognition of contagiousness and the simple though somewhat barbarous means that were taken to prevent the spread of contagion. Similar, though more humane, measures have been responsible in more recent years for the control of leprosy in European countries like Norway and Iceland.

Though there are still upwards of one hundred leprous subjects in England—people who have contracted the disease in the course of their work in the Tropics—leprosy is no longer considered a menace in this country, and is not even a notifiable disease. Its power to spread from the infected to the healthy is of a low order, considerably lower, for instance, than that of the sister disease—tuberculosis—which is still notifiable. Why, then, does leprosy persist in lands like China, India, and Africa when it has ceased to be a menace in most of the countries of Europe and North America? There seems little doubt that it belongs to a certain stage of sanitation and human development. Among wild, free-living, nomadic tribes leprosy is seldom found. Under moderately sanitary conditions it fails to spread. It is in the congested and filthy surroundings of family or communal life so common in the Tropics and subtropics that the requirements for contagion are found. This is further helped by parasitic and especially cutaneous disorders which facilitate the entrance of infection. Not less important is the debilitating effect of various other diseases and poor nutrition so prevalent in backward countries; these predispose to leprosy. It may be objected that sanitation even in England leaves much to be desired, at least in depressed or slum areas: why, then, is leprosy seldom spread by the uncontrolled lepers at present in this country? The latter are almost always men and women who take necessary precautions to avoid contact with others, and they are seldom people who come in close contact with young children. Recent investigations tend to show that it is the infection of young children that is chiefly responsible for the persistence of leprosy in a community. Healthy adults seldom acquire the disease; or if they do it is generally a mild uninfectious form which tends to die out.

In the control of leprosy compulsory segregation enforced from without the community has generally been found ineffective. It tends to produce concealment, and thus fails in its object. It is a different matter when pressure is brought to bear from within the community as it was in England in the fourteenth century. If the community knows the danger and its source, knows that its children are in danger if they come in contact with the leper, knows that effective segregation is the only means of averting that danger, then it is likely to see that the necessary means are taken to avert that danger. The means taken to deal with leprosy will vary in different countries and districts; but whatever methods are used they must centre round an educative programme. In India and Africa the almshouse and lazaret are being replaced by the agricultural and industrial settlement, with occupational therapy, which renders the patient hopeful and happy. This is an excellent step in the right direction. But these settlements, though economically run and to a large extent self-supporting, still

cost much money, and reach only a very small fraction of those suffering from leprosy. The leper settlement can, however, be used as a centre for education and enlightenment. The patients themselves can be trained so that when they recover and return to their villages they may help to spread knowledge regarding the nature of leprosy and the simple measures needed to prevent its dissemination. We are told that in England in the Middle Ages lepers congregated in brothels and sought to disseminate infection. Hopeless themselves of recovery, they bore a grudge against those who had outcast them, and they thus sought to add to their numbers. The modern educational settlement seeks to reverse the process. It gives hope to the victim and sends him out on recovery to spread the gospel of hope and prevention.

The final control and eradication of leprosy must necessarily wait till the sanitary education and general amelioration of the people of backward communities is accomplished. But leprosy can be used as a lever in raising the standard of living and hygiene. In England the lazaret and almshouse was the prototype of our modern hospital. The preventive measures centring in the funeral mass and separating the leper from his fellows was the earliest dawn of our present sanitary system. Leprosy is not a fatal disease. It is dreaded not because it kills like tuberculosis, cancer, and cholera but because it condemns its victim to long years of living death. This dread can be used as a powerful impulse in the campaign for clearing up not only leprosy but also the other diseases, insanitary conditions, and dietary deficiencies which predispose to leprosy.

The British Empire Leprosy Relief Association is seeking to work along the lines sketched above. During the thirteen years since its inception it has taken a leading place in the clinical, pathological, and bacteriological investigation of the disease, and has made extensive epidemiological surveys in India, Africa, and other parts of the British Empire. It seeks to advise Governments, missionary societies, and philanthropic bodies regarding the many problems connected with leprosy and the best methods for its control. Within the last few years it has sent out doctors and medical assistants to Africa and India. Leprosy, though so important a disease in the Tropics, is but imperfectly understood in England, and the association seeks, through lectures and by means of its quarterly publications *The Leprosy Review* and *Leprosy in India* and other literature, to interest and inform the medical profession as well as the lay public regarding the disease and to enlist their support in the anti-leprosy campaign.

GASTROSCOPY

Since cystoscopy and sigmoidoscopy furnish information which cannot be obtained by other means at our disposal, and are in consequence practised daily, it might be expected that an endoscopic examination of the stomach would be an equally valuable procedure, and in time become as widespread and as relatively common in practice. Exploratory laparotomy for suspected gastric disease is still carried out in certain cases in which, despite recent improvements in radiology and careful clinico-pathological investigations, it has not been possible to make a diagnosis; but even when the stomach is exposed at operation there may be little or no evidence as to the condition of its mucosa. Rovsing's gastroscope, or a substitute for it in the shape of a single catheterizing cystoscope introduced through a small opening into the air-filled stomach, carries such an investigation a stage further, but its use necessitates gastrotomy as well as laparotomy. For many years attempts have been made to examine the stomach by means of an illuminated tube passed down the oesophagus. The first experiments were conducted nearly seventy years ago, at a time when the electric incandescent lamp was unknown; but although with the arrival of the Edison-Swan vacuum lamp great advances were made in all forms of endoscopy there was some delay in utilizing to the full this method of exploration of the stomach lining. The procedure was technically difficult and dangerous and the view afforded of the interior of the stomach limited and unsatisfactory, but with the introduction of the Wolf-Schindler gastroscope, which is a semi-flexible instrument, most of the disadvantages were overcome.

Schindler and his collaborators[1] in Chicago have now examined more than 2,500 patients gastroscopically, and have observed some of them over a number of years, one patient having been gastroscoped sixty-five times. Many other workers have been investigating the possibilities of gastroscopy. H. W. Rodgers[2] at St. Bartholomew's Hospital has introduced a useful modification of the Wolf-Schindler instrument in the shape of a distensible rubber bag placed near the examination lens, so that when the observer introduces air into the bag the tip of the instrument with the examining lens is lifted away from the folds of the gastric mucous membrane and their inspection facilitated. In this country, also, studies have been made among others by H. C. Edwards at King's College Hospital, R. S. Aitken in Professor Fraser's clinic at the

[1] *Journ. Amer. med. Ass.*, February 6, 1937, **108**, p. 465.
[2] *Lancet*, 1936, **2**, 438.

British Post-Graduate Medical School, and Hermon Taylor, who, working as a Moynihan Fellow of the Association of Surgeons in Sir James Walton's clinic at the London Hospital, has recently reported his experiences.[3 4] These have shown that it is possible to detect gastric ulcers which are not demonstrated radiographically and to recognize certain doubtful cases as either malignant or benign. Perhaps one of the most interesting observations that have been made with the aid of the gastroscope is that gastritis is far commoner than has hitherto been supposed; and in the diagnosis of this gastroscopy is far superior to radiology. Erosions and atrophy of the gastric mucosa can for all practical purposes be diagnosed only by gastroscopy.[5] René Chevallier of Lyons[6] has found this method of investigation of value in the study of obscure cases of gastric haemorrhage. There can be no doubt that with the help of this new instrument of precision we shall be on the way to the solution of many problems relating to disorders of the stomach. Technical details are being mastered, the instruments in use improved, and the indications and contraindications better understood. We suggest that the time will soon be opportune for a combined discussion by physicians and surgeons with experience of this valuable diagnostic measure so that its limitations and indications may be clearly established. Although it does not seem probable that gastroscopy will rival or replace radiology in the diagnosis of diseases of the stomach, it is obviously a more direct method of examination, and should therefore yield more positive, if more limited, information; finally, anything that may obviate an exploratory laparotomy is to be welcomed.

RESEARCHES ON INFLUENZA

Now that another widespread epidemic of influenza is just over we may ask ourselves how far this visitation has advanced our knowledge of the disease. In one direction it has certainly served a useful purpose: the primary aetiology of the disease is now finally settled. Whatever may have been the significance of earlier work with filter-passing agents, the discovery by Andrewes, Laidlaw, and Wilson Smith that a virus recoverable from human cases could be transmitted to and maintained in the ferret has made it possible to compare the findings in epidemics not only in different countries but in different years; and among the facts recorded by Hoyle and Fairbrother in their paper in our present issue is the identity of strains of virus isolated in Manchester during this winter with the strain which has now been maintained for three years by the Medical Research Council workers at Hampstead. This is not to say that every case of clinical influenza is due to the virus; there have been many fruitless attempts to recover it during the past three years from cases meriting the diagnosis, and it must be conceded that the syndrome, or something very closely approaching it, may arise from other causes. But as the cause of widespread epidemics this virus now stands fully accepted. Among items in the chain of proof is the case of accidental transmission back from ferret to man which is now put on record in the annual report of the Medical Research Council: attributed to the sneeze of an infected ferret, this attack was fully studied from the serological standpoint, and there are other good reasons for regarding this as its true origin. Among new methods of study is the demonstration of antibodies in the blood of recovered cases and other immune individuals, either by animal protection tests or otherwise. Hoyle and Fairbrother have succeeded in adapting the complement-fixation test to this purpose and so found a means of determining the amount of antibody present with some degree of precision: they have also been able to relate this amount roughly to degrees of resistance to infection, and suggest that such a test may be useful in deciding whether artificial immunization is desirable in any individual case. The prospects in this direction are of more interest henceforward than any other aspect of the matter, and here progress in the clinical field is bound to be slow, since the opportunities of practical test are short and busy periods recurring at long intervals. Active immunization with living virus given by subcutaneous injection has been attempted in the United States, and in this country a limited number of people have been treated with formalinized virus with, it is understood, inconclusive results. It is too much to hope that the methods at present available will provide any generally applicable form of prophylaxis, nor does it seem likely that immunity thus obtained will be of long duration. At the most a further epidemic, such as may be expected in a few years' time, will enable these proceedings to be tested on a larger scale.

[3] *Brit. Journ. Surg.*, January, 1937, **95**, p. 469.
[4] *Lond. Hosp. Gaz.*, 1937, **40**.
[5] Schloss, Ettinger, and Pratt (1937). *Amer. J. med. Sci.*, February, **193**, p. 171.
[6] *Lyon Méd.*, No. 1, January 3, 1937, **96**, p. 3.

AMMONIA FORMATION IN THE LUNGS

Many organs in the body are capable of de-aminizing amino-acids, with the consequent liberation of ammonia and a fatty acid. The liver is specially important in this respect, and here the resulting ammonia is entirely converted into urea: according to Krebs the ammonia unites with carbon dioxide and ornithine to form arginine, which is then broken down by the enzyme arginase into ornithine and urea. The ammonia formed in the kidney is believed to be secreted by the renal tubules into the blood in amounts which depend on its hydrogen-ion concentration. The resulting ammonium salts are subsequently excreted in the urine, and this mechanism is of considerable importance in preserving the reaction of the blood within narrow limits. There is evidence also that during muscular contraction adenyl-pyrophosphate (one of the complex organic phosphates found in muscle) is broken down and ammonia is one of the products of its disintegration. It has been also suggested that ammonia is formed

in nerve fibres when activity is taking place. A recent paper by Binet and Bargetson[1] shows that the lungs may also possess the power of forming ammonia from various nitrogenous constituents of the blood and from added polypeptides and amino-acids. These workers perfused isolated lungs with blood for periods usually of one to three hours, and determined the changes in the ammonia content of the blood. In control experiments they found that there was a small spontaneous rise of blood ammonia of the order of 25 per cent. Expressing ammonia in milligrammes of nitrogen per litre, a rise occurred from 1.09 to 1.36 in three hours. When the blood was passed through the lungs for the same length of time the increase in blood ammonia was much greater—for example, from 1.09 to 3.04, or by 180 per cent. When polypeptide in a concentration of 1 gramme per litre was added to the perfused blood the rate of ammonia formation increased markedly—for example, from 2.6 to 10.2 mg. in three hours, or by nearly 300 per cent. Similar additions to the blood in control experiments had no effect on the rate of ammonia formation. The addition of glycine-glycine, or of the simple amino-acids alanine or glycine, led to equally marked changes when the blood was perfused through the lungs. Working with alanine they were able also to demonstrate that pyruvic acid was formed and that the respiratory quotient was lowered from 1.0 to 0.68 in three hours. The rate of de-amination of alanine was not diminished by the presence in the perfusing blood of added quantities of pyruvic acid and ammonium carbonate. These experiments indicate that the lungs may be normally concerned with certain phases of nitrogenous metabolism.

[1] *Presse méd.*, January 13, 1937. p. 57.

ROYAL MEDICAL BENEVOLENT FUND

The one hundred and first annual meeting of the Royal Medical Benevolent Fund was held on March 16, Sir Thomas Barlow presiding. It was announced that the King had consented to become patron of the Fund. Mr. R. M. Handfield-Jones, in his report as honorary secretary, after an account of the various activities of the centenary year, said that the special appeal, including Sir Thomas Barlow's generous gift of £1,000, had produced £4,532, from which the cost of the appeal (£660) must be deducted. In addition 117 new subscribers were enrolled, and as a result of a second appeal to practitioners living in the London district a further 220, making 337 in all. A similar reminder was going out to practitioners in the rest of the country. It was the intention to keep the centenary fund open for a few months longer. It would be treated as capital and invested, the interest being added to the amount available for annuities and grants. The ordinary annual income from subscriptions and donations had risen by some £500 to £12,671 during the past year. Reference was also made to special efforts in various parts of the country, notably a centenary ball at Wallasey which brought in £200. Five Divisions of the British Medical Association had also arranged social functions which resulted in generous contributions being forwarded to the Fund. Another result of centenary publicity had been to increase the number of applicants. During 1936 there were 136 new applicants, and the total number of grants voted was 622 against 567 in the previous year. At the end of 1936 there were 229 annuitants on the books, so that 851 persons in all had received financial help during the year, the total amount disbursed in charity being £21,447. The honorary treasurer (Dr. Lewis G. Glover) mentioned one or two further points. A very small legacy of £286 received during the year was from one of the beneficiaries of the Fund, who had left to it the whole of her little capital. The investments of the Fund now amounted to a book value of £192,000, their present market value being £228,000. He also referred to the important work of the Ladies' Guild, which administered about £7,000 a year in relief, maintenance, education, and various other forms of charity, including the provision of clothes for the poorer beneficiaries. Educational help was very important, especially among the girls, and he thought the Guild might with advantage devote more of its funds to that side of the work, the others being taken over by the Fund itself. Dr. Glover added that while the Fund received substantial backing from many quarters it still had not enlisted the support from the rank and file of the profession which it ought to enjoy. He hoped that as a result of the centenary appeal the support would become more general.

The resolution to adopt the report was moved by Mr. Bertram Sutton, who referred to the low level of administration expenses, and also to the promptitude with which applications were met. In seconding, Dr. Herbert Spencer expressed disappointment at the result of the centenary appeal; it seemed to him that £4,500 was a very small sum to have been received from the profession, especially in view of the example set by the president in his magnificent gift. The report was adopted, and on the motion of Sir D'Arcy Power, seconded by Mr. Sampson Handley, the president and other officers were re-elected, with thanks to them for their services. The members of the committee of management who retire by rotation were also re-elected, these including Dr. C. O. Hawthorne as representative of the British Medical Association. One new member was appointed to the committee—Dr. W. G. Harnett of Barnet. The remainder of the meeting was occupied with complimentary proceedings. The president expressed the indebtedness of the Fund to the medical journals for much valuable publicity, and also thanked the British Medical Association for help received directly and indirectly. The Panel Committees in different parts of the country were assisting, but he agreed with what had been said that from the general body of the profession much larger contributions ought to be forthcoming. He hoped that the Fund was at the beginning of a new period of prosperity which would surpass anything achieved in its long history. In expressing the thanks and homage of the gathering to Sir Thomas Barlow, Mr. Handfield-Jones referred to the fact that there was a difference only of nine years between the age of the Fund and that of its president, and he hoped that in due time the Fund would have the joy of celebrating Sir Thomas's centenary.

A NEW METHOD OF CENTRIFUGATION

W. J. Elford[1] has recently described a new technique enabling the sedimentation rate of small particles to be studied with the ordinary bucket type of high-speed centrifuge. It consists essentially in arranging for an inverted capillary tube 1 cm. long and 0.25 cm. or less in diameter to dip into the main bulk of liquid contained in the centrifuge bucket. By this means sedimentation may occur within the inverted tube under conditions for which Stokes's law may be directly applied. The sedimented particles pass through the open lower end of the capillary tube and are collected on to a piece of filter paper. After centrifugation for a given time at a given speed the capillary tube is withdrawn. The fluid is retained within it by atmospheric pressure and capillary attraction. From an estimation of the average concentration of particles in the fluid before and after a period of controlled centrifugation it is possible to calculate the average particle size in the suspension. In practice an Ecco supercentrifuge was used capable of speeds up to 15,000 revolutions per minute. The centrifuge cells were made of an aluminium-silicon alloy of great tensile strength. In order to increase the amount of liquid available for testing, an arrangement was made permitting seven centrifuge cells to dip simultaneously into the fluid in each bucket. The results obtained by this method were similar to those already reached by the Svedberg method of ultracentrifugal analysis and by the ultrafiltration method. The mean diameter of *Chromo. prodigiosum* was found to be 0.7 to 0.8μ and the mean density 1.10. The corresponding values for staphylococcus K phage were 60 to 70mμ and 1.25. The diameter of S 13 phage, haemocyanine, and edestin was 15 to 17mμ, 22mμ, and 8mμ respectively. It is interesting to note that the bacteriophages have densities approaching those of the proteins, indicating a more compact structure than that of the bacteria.

VENTILATION OF FACTORIES

The Home Office has published a third edition of its welfare pamphlet on the ventilation of factories and workshops.[2] This calls for little comment as it closely resembles its predecessor. The section dealing with propeller and pressure fans is excellent, and is very well illustrated, but the other sections almost inevitably suffer from the attempt to treat problems of ventilation by themselves, apart from their relation to problems of heating. For example, mention is made of the discomfort caused by the air at head level being at a considerably higher temperature than that at foot level, and the suggestion is made that the condition may be mitigated by means of a fan which will disturb and mix up the air. Yet we find no reference to a much better method of avoiding high temperature gradients—namely, to choose a suitable heating installation. Again, no fewer than three illustrations are given of fan extraction at floor level on one side of the factory, coupled with heating coils installed on the opposite side in such a manner as to send the warmed air to the ceiling. This plan would cause the maximum discomfort to most of the workers in the factory, for not only would the air temperature at head level be much higher than at floor level, but there would be a continuous strong draught round the feet of the workers. The section of the pamphlet specifically dealing with heating is only two pages in length, so it is to be hoped that future editions will treat the subject much more fully and will describe it in combination with that of ventilation.

[1] *Brit. J. exp. Path.*, October, 1936, p. 399.
[2] Home Office Welfare Pamphlet No. 5. 1937. H.M. Stationery Office. (1s.)

THE NEW GREAT ORMOND STREET

On March 17 the Princess Royal revisited her training school when she performed the ceremony of laying the foundation stone of the main block of the new Hospital for Sick Children, Great Ormond Street. Her Royal Highness, who is president of the hospital, served there as a nurse during the war, and it was therefore a very friendly ceremony since all those present were united in their great love of the institution. The inscription on the foundation stone runs as follows: "H.R.H. the Princess Royal, president of the hospital, laid this stone, round which the new buildings, long planned in hope, are to-day rising in fulfilment. 17th March, 1937." This foundation stone is for the main block, which will contain the medical and surgical wards, the operating theatres, pathological and research departments, together with the lecture rooms and library for the medical school. The estimated cost of this part of the work is £240,000 and it is the second stage in the reconstruction of the whole place, the first being the nurses' home, the last section of which is practically completed. The new hospital will be a tall building consisting of two "L-shaped" units communicating at the angles to make one long block on the north aspect with two wings running south, so that by the skilful use of balconies on every floor there will be a sunny aspect for each ward. This new building lies just short of the most northerly aspect of the present site of the old hospital, and the old buildings will eventually be demolished, giving place to a single-story out-patient block and administrative buildings. An appeal has now been issued to the general public for the money necessary to pay for this next stage in the hospital's reconstruction, and an attractive booklet is available on application to the secretary. An institution which can boast of the names of Sir William Jenner, Sir Thomas Barlow, Sir Charles Ballance, and Dr. W. B. Cheadle as former members of its staff should surely command public support because of the great importance of the work performed by those pioneers. It is to be hoped that this will be speedily recognized.

On March 22 Viscount Dawson of Penn was re-elected President of the Royal College of Physicians of London.

An announcement will be found in our University News of the appointment of Mr. H. L. Eason, M.D., F.R.C.S., to the post of Principal of the University of London from July 1, 1937, to September 30, 1941.

ENDOCRINES IN THEORY AND PRACTICE

This article is one of a series on Endocrinology contributed by invitation

THE HORMONE TREATMENT OF SOME DISORDERS OF PREGNANCY

BY

T. N. A. JEFFCOATE, M.D., F.R.C.S.Ed.

PART I

Pregnancy is normally accompanied by profound modifications of the whole endocrine system. The ovary, thyroid, parathyroid, adrenal, pancreas, and pituitary undergo well-recognized functional, and even structural, alterations, and a new ductless gland—the placenta—is temporarily added to the system. The products of these glands play a major part in the normal progress of pregnancy, and anomalies in their relative quantities or qualities are important factors in the causation of many of the pathological states; hence hormone treatment for disorders of gestation is being rapidly developed. Rational organotherapy is dependent on endocrinology, but since the origin and functions of the various hormones have been discussed elsewhere in this series only a brief relevant summary of physiological principles is included here.

Physiological Principles

The preparation of the endometrium for the successful embedding of the ovum is dependent on the corpus luteum hormone (progestin). The same hormone, by a direct action on the muscle, also inhibits uterine contractions and thus prevents expulsion of the ovum. Nevertheless in the human subject the corpus luteum is not essential to the progress of pregnancy after the sixth to eighth week. During the later stages of gestation uterine quiescence is determined by humoral factors whose identity is not yet proven: it is possible that the placenta secretes a progestin-like principle.

The gonadotropic hormones (prolan, prolan A and B), as their name denotes, act primarily on the gonad, and since they are responsible for the persistence and activity of the corpus luteum they indirectly inhibit uterine activity. In the human subject, however, they may also have a direct effect on uterine muscle, and this possibility is of importance in therapy, since it has never been convincingly demonstrated that the present preparations of gonadotropic hormones (from pregnancy urine or placenta) have a luteinizing action in woman.

As pregnancy advances the uterine muscle hypertrophies, its spontaneous contractions increase in number and amplitude, and it develops a sensitiveness manifested by enhanced ability to respond to both mechanical and chemical stimuli. These changes are the result of the direct action of oestrogenic hormones (oestrin) on the myometrium. The continuance of pregnancy is dependent on a hormonic balance in which the inhibiting principles predominate, and any disturbance of the balance which leads to an ascendancy of the oestrogenic hormones brings about the termination of pregnancy in the form of abortion or labour. But it is of prime practical importance to realize that this balance is not a simple quantitative one: thus a uterus under the influence of progestin cannot be excited by oestrogenic substances, even if they are administered in relatively large amounts.

The role of the posterior lobe of the pituitary during pregnancy is still in dispute. It is quite possible that the powerful oxytocic secretion of this gland is concerned in initiating and sustaining the expulsive uterine contractions of parturition.

Principles of Treatment with Placental and Ovarian Hormones

HORMONE PREPARATIONS

Only preparations standardized in approved animal or international units are recommended. All others are relatively impotent and worthless. Whole-gland products or "cocktail" preparations are whole-heartedly condemned. Under present conditions of manufacture or extraction reliable preparations are inevitably costly.

The standardized preparations most commonly used and easily available in this country are:

Corpus luteum hormone (progestin; progesterone).
- Proluton (Schering Ltd.).
- Progestin (Organon Laboratories).
- Progestin (British Drug Houses).
- Lutren (Bayer).

Oestrogenic substances (oestrin).

(*a*) Ketohydroxyoestrin:
- Progynon (Schering Ltd.).
- Menformon or folliculin menformon (Organon Laboratories).
- Oestroform (British Drug Houses).
- Theelin (Parke, Davis and Co.).

(*b*) Oestradiol benzoate:
- Progynon B (Schering Ltd.).
- Di-menformon (Organon Laboratories).
- Oestroform B (British Drug Houses).

Gonadotropic hormones (prolan, prolan A, prolan B). (From placenta and pregnancy urine.)
- Pregnyl (Organon Laboratories).
- Antuitrin "S" (Parke, Davis and Co.).
- Gonan (British Drug Houses).

Gonadotropic hormones are easily destroyed by heat, and should be kept in a cool store and injected from a cold syringe. Even under ideal conditions *solutions* of these hormones rapidly deteriorate, and they should not be used later than four months after manufacture.

MODE OF ADMINISTRATION

Oral administration of hormones, other than thyroid and oestrogenic extracts, is futile. Moreover, capsules of the latter have a very limited application, since these hormones are only one-fifth as active when administered by mouth as when injected parenterally. The gonadotropic, pituitary, and corpus luteum hormones are completely inactivated by digestive juices. Intramuscular or subcutaneous injections are, with a few exceptions, preferable to intravenous medication.

DOSAGE

Most hormones are better given in divided doses than in a single massive one. In the body they are quickly destroyed, inactivated, or excreted, and to obtain a maximal and continued effect injections should be repeated at regular and frequent intervals. Continuity of treatment

is further improved if the hormones are given in an oily medium: absorption from the tissues then takes place more slowly. Most preparations of corpus luteum and oestrogenic hormones are now supplied as solutions in oil.

TIME RESPONSES

As a rule there is no *immediate* response to injections of these hormones. The inhibiting action of progestin and gonadotropic hormones is seen in a few hours, although it is stated that when large doses are used an effect may be produced within fifteen to thirty minutes. Oestrogenic substances, however, do not influence uterine contractions until six to twelve hours have elapsed, and the maximum effect is not apparent until at least twenty to twenty-four hours after an injection.

Threatened Abortion

The hormone treatment of threatened abortion does not replace, but is accessory to, the present well-established methods of treatment with sedatives and rest. Gross causes such as uterine retroflexion must be excluded or corrected. The object of organotherapy is essentially to allay expulsive uterine contractions by inhibition of the muscle. For this purpose corpus luteum hormone should be administered intramuscularly in doses of 2 international units daily from the onset of symptoms until one week after pain and bleeding have ceased. Subsequently, especially for patients with a known tendency to abort, injections of 1 international unit should be made twice weekly up to the thirty-second week of pregnancy. For patients showing no response to treatment the dose may be increased, and 10 international units, in single or divided doses, may be injected daily without harmful effect.

As an alternative to progestin, gonadotropic hormones may be administered—also with the object of bringing about uterine quiescence. The dosage should be 100 rat units, injected twice daily; this should be continued until the patient has been free from symptoms for one week. On occasion the amount prescribed may be increased to as much as 500 rat units daily, but the present commercial preparations are apt to give rise to mild local or general reactions when injected in large amounts.

Although good results are reported for the treatment of threatened abortion with progestin or prolan, failures are not infrequent. This is only to be expected when the foetus is dead or the membranes ruptured, and success is unlikely, and indeed undesirable, in the presence of foetal abnormalities—a common cause of abortion.

Whereas either of these methods of hormone treatment may be used with advantage, progestin therapy is the more efficacious.

Repeated Abortion and Habitual Death of the Foetus

In many cases of habitual abortion, defective placental implantation, or repeated intra-uterine death of the foetus, no cause can be found. In such circumstances it is conceivable that an upset in the pregnancy endocrine balance is the underlying fault.

The management of such cases is based on the same principle as is that for the treatment of threatened abortion, and has for its object the maintenance of uterine quiescence. Treatment should be begun as early as possible in pregnancy or perhaps before conception occurs. In the latter case the object is to prepare a healthy pregravid endometrium, and to this end 1 international unit of progestin should be injected twice weekly during the second half of each menstrual cycle—beginning about the sixteenth day after the first day of the last menstrual period. This progestational treatment is less important than therapy during pregnancy, and is of theoretical rather than practical value. Moreover, its application is difficult, and it may have to be continued for several months, because the occurrence of conception is so fortuitous.

As soon as pregnancy is established inhibitive hormones (progestin, 1 international unit twice weekly, or gonadotropic hormone, 100 rat units twice weekly) should be given and their administration continued until the thirty-second week of pregnancy. It is generally considered advisable to discontinue the treatment after this time for fear of prolonging the pregnancy past term: this is only a remote contingency. Some clinicians insist that doses as small as 1/25 rabbit unit of progestin are equally efficacious in preventing habitual abortion, and many state that it is unnecessary to continue treatment after the fourth month. In my opinion it is unwise to give less than the dosage recommended above.

For some years past habitual abortion has been treated extensively with corpus luteum tablets, and many clinicians have claimed results which are quite as imposing as those published for the newer progestin preparations. Such corpus luteum tablets, for oral use, contain very little, if any, progesterone, and are incapable of producing hormonic effects in the body. Treatment with these preparations is therefore purely empirical, and the claims made for their usefulness serve to emphasize the difficulty in assessing the value of any form of treatment for such a condition as habitual abortion.

Another form of organotherapy is now becoming increasingly popular—namely, the administration of thyroid. The rationale is more obscure than that which defines the use of other hormones, but it is based on the fact that the body during pregnancy makes great demands on the thyroid and that enlargement of this gland is frequently present in cases of habitual abortion. Moreover, there is experimental evidence to show that the presence of an optimum amount of thyroxine is important for the progress of normal pregnancy. Whatever the exact rationale may be, thyroid therapy is undoubtedly as good as, if not better than, the other forms of hormone treatment outlined above. It is less costly and can be given orally. The dose recommended is thyroid extract 1 grain each day throughout the duration of pregnancy. It may be combined with the other methods of hormone therapy. In spite of the difficulty in assessing results the evidence now accumulated leaves no doubt that treatment with gonadotropic, corpus luteum, or thyroid hormones is successful in a large number of cases. Of the types of organotherapy mentioned I prefer to use thyroid extract combined, when financial and other circumstances permit, with progestin.

Although it is permissible to assume the presence of an endocrinous causal factor in many cases of unexplained habitual abortion and death of the foetus, this assumption is not always justified, and other factors such as vitamin deficiency not infrequently play a part. Since the present state of knowledge precludes more accurate subdivision of these cases from the aetiological standpoint, treatment should never be limited to organotherapy. Attention to general health, and avoidance by the patient of constipation, coitus, and strenuous physical exercise, remain essential to the management of these cases. The administration of vitamin E is especially important accessory treatment. Furthermore, it is well to remember that for cases of habitual death of the foetus induction of premature labour is carried out as a routine by some authorities.

Finally, it must be emphasized that the successful culmination of one pregnancy as the result of treatment does not mean that the underlying cause of the abortions has been permanently corrected. Similar therapeutic measures must be adopted in each subsequent pregnancy.

Therapeutic Induction of Abortion

In view of the ability of oestrogenic substances to increase uterine sensitivity it seems at first sight that their administration in large amounts at any stage in pregnancy should lead to the onset of expulsive uterine contractions. However, reference has already been made to the fact that the so-called "hormone balance" does not imply a condition of simple quantitative equilibrium, but rather a qualitative state in which either oestrin or progestin is dominant. This is certainly true for the human subject, and it is now proved conclusively that normal pregnancy cannot be terminated in its early stages even if millions of units of oestrogenic hormone, together with large doses of posterior pituitary extract, are administered. If, however, the foetus is dead and retained *in utero*—a condition which implies a disturbed hormone balance—expulsive uterine contractions can be developed by hormone agents (see later).

Induction of Labour, Prematurely or at Term

Use of Posterior Pituitary Hormone.—Extracts of the posterior lobe of the pituitary have long been used for purposes of medicinal induction of labour. Their injection is usually preceded by the administration of castor oil and one of the salts of quinine. I recommend quinine sulphate, 10 grains repeated three times at one-hourly intervals, followed by four injections, at one-hourly intervals, of 5 units of pituitary principle. Any medicinal method of induction of this type usually fails to bring on labour unless the pregnancy has reached term or unless the uterus is unduly sensitive.

Use of Oestrogenic Hormone.—In late pregnancy, when the influence of inhibiting factors is waning, the administration of oestrogenic hormones undoubtedly increases uterine sensitivity. Nevertheless they must be given repeatedly for several days, and even then their sensitizing action is so unreliable that the subsequent application of powerful oxytocic factors, such as quinine and posterior pituitary extract, fails to bring on uterine contractions in at least 50 per cent. of cases. A method of induction of labour which is uncertain and so slow as frequently to take seven or eight days to bring about its effect is of little practical value. But oestrogenic substance may be helpful as an accessory to mechanical induction of labour, more particularly when artificial rupture of the membranes or the intra-uterine insertion of bougies or stomach tube has failed to bring on expulsive uterine contractions. In such cases 20,000 to 40,000 international benzoate units (100,000 to 200,000 international units) of oestradiol benzoate injected intramuscularly, four-hourly, appear to improve uterine tone and lead to the onset of labour within twenty-four to forty-eight hours.

(*To be continued*)

At the March meeting of the Central Midwives Board for England and Wales the revised list of approved teachers, as submitted, was approved for the purpose of the conduct of training under the present rules of the Board, subject to satisfactory replies to questions in certain cases. The application of Eric Arthur Gerrard, M.D., for approval as examiner was granted.

MEDICAL RESEARCH COUNCIL

ANNUAL REPORT FOR 1935-6*

Clinical Research

The Medical Research Council staffs and supports (save for the post of director, which is endowed by the Rockefeller Foundation) the department of clinical research at University College Hospital, London, and supports the directors of the clinical research unit at Guy's and the neurological research unit at Queen Square. Some interesting work from each of these departments is embodied in the report of the Council.

The report from University College Hospital is largely occupied with Sir Thomas Lewis's studies of the effects of embolism and other work on vascular disorders. G. W. Pickering has been engaged here in a series of investigations concerning the mechanism of high blood pressure. It has been shown that the carotid sinus mechanism remains active in persistent hypertension, but the observation that changes in arterial and venous pressures produced by the intravenous injection of small quantities of adrenaline are greater in subjects with nephritic and malignant hypertension than in normal subjects and those with essential hypertension was not confirmed. A quick transfusion of as much as 600 c.cm. of blood from patients with essential hypertension into anaemic patients has been shown to produce only very small rises in blood pressure, no greater than those produced by similar quantities of normal blood.

At Manchester Royal Infirmary one of the many external research schemes supported by the Council has been directed to an investigation into the aetiology and treatment of pernicious anaemia and other diseases of the blood-forming organs. Some 800 patients with pernicious anaemia are now under regular observation, and in those who co-operate adequately it has been found relatively easy to maintain good health and normal blood counts by modern methods of treatment. Further work on the properties of haemopoietin supports the view that this intrinsic anti-anaemic principle of stomach is an enzyme, but the nature of the extrinsic factor has yet to be determined. At Aberdeen further investigations have been made on the treatment of pernicious anaemia by the Dakin and West liver fraction, anahaemin, and it appears that for most cases one injection of 5 c.cm. of anahaemin every eight weeks suffices to maintain the blood count at a satisfactory level.

In Sir David Wilkie's department at Edinburgh part-time grants have been made to two workers engaged on the study of cause of death after extensive burns. The tissue fluid from the burned area has been found to contain poisonous substances produced by chemical breakdown of the damaged cells and independently of bacterial action. Clinical observations suggest that the acute and severe toxaemia which develops soon after extensive burns can be successfully treated by extracts of suprarenal cortex. At Glasgow University other grantees have shown that fracture of bone with adjacent muscle damage leads to a rapid increase in the normal breakdown of protein, and hence to increased excretion of nitrogen in urine, and of creatine also; when the muscle only is damaged and the bone not fractured the nitrogen loss is much less.

Neurology

At Queen Square Hospital, London, a study of the dynamics of the cerebro-spinal fluid which the unit began

**Report of Medical Research Council for 1935-6.* Cmd. 5378. London: H.M. Stationery Office. (3s. net.) Notice concluded from March 20 (p. 616).

two years ago has been continued, and by varying the posture of the subject and the degree of vascular congestion within the cranial cavity it has been shown that the lumbar cerebro-spinal fluid pressure is a direct reflection of the lumbar venous pressure and independent of the elasticity of the spinal theca.

Among various work undertaken at mental institutions an examination has been made of the trypanocidal activity of the cerebro-spinal fluid after injections of tryparsamide and other pentavalent and trivalent arsenicals. It seems likely that the method will have practical value for determining the probable efficacy of new compounds of this type before they are subjected to large-scale clinical trials. At the Bernhard Baron Institute of Pathology at the London Hospital work has been proceeding on tumours arising in the meninges of the brain or spinal cord. It has been found in the course of this work that the migrating tumour cells of some meningiomata contain intranuclear inclusion bodies similar to those previously described in the gliomata. Attempts are being made to shed light on the nature of these bodies and their possible relation to the filterable viruses.

Tuberculosis

During the year under review various research has been undertaken into tuberculosis. A. Stanley Griffith with J. Smith at Cambridge has determined the types of tubercle bacilli responsible for 436 cases of the pulmonary disease in North-East Scotland, of which 207 were in the city of Aberdeen and 229 distributed in the rural districts. In the former series 6.3 per cent. were infected with bovine tubercle bacilli, and in the latter 9.1 per cent. The percentage incidence of bovine infections in North-East Scotland is higher than in other parts of the country. In the Department of Tuberculosis, Welsh National School of Medicine, further work has been done on the powers of coal and other dusts to adsorb the active principles of tuberculin and to render it less toxic. Observations have been continued on the chemotherapeutic action in tuberculosis of a gold compound prepared by Sir Gilbert Morgan of the Chemical Research Laboratory, Teddington. Encouraging results have been obtained in laboratory tests, but it is too early as yet to assess clinical value. Enid Williams has investigated the medical after-histories of a series of old and retired coal-miners first examined by her in 1930. Her findings suggest that the symptomless type of pulmonary tuberculosis which occurs in elderly men with pneumonoconiosis progresses rapidly once it reaches a stage at which it can be diagnosed by sputum examinations.

Bradford Hill has continued a study of the epidemiology of phthisis in young adults, and indicates that one of the factors responsible for the relatively unfavourable mortality in this country at the young adult ages is a change in the volume and direction of the internal movement of population as between country and town. The theory he advances seems very tenable, though it has some obscure points.

In connexion with the late result of the treatment of pulmonary tuberculosis by artificial pneumothorax attention is drawn to a report by F. J. Bentley, who suggests that, having regard to the large number of deaths from tuberculosis of the lungs in young male adults, this treatment might well be used more extensively in such cases. Admittedly it is a treatment of limited application, but one of great importance among properly selected individual sufferers, for whom it sensibly increases the expectation of life and of working capacity.

Vitamin Studies and Nutritional Problems

From several of the external research schemes work on the vitamin problem is still being reported. At the Lister Institute some studies of the B vitamins in wheaten flour and bread, not yet completed, indicate so far as they have gone that white bread and white flour contain more vitamin B_1 than has hitherto been supposed, and that both white flour and wholemeal flour are good sources of vitamin B_6 but relatively deficient in flavine. J. C. Drummond and his assistants at University College, London, working with a grant from the Council, have continued their researches into the chemistry of vitamin A and vitamin E. Attempts are being made to isolate a crystalline derivative of vitamin A from which it may be possible to separate the vitamin in pure form. At several centres the vitamin C reserves of human subjects as measured by urinary excretion of the vitamin have been studied. Volunteers have been given graded allowances of vitamin C, and it has been shown that its excretion is quantitatively related to intake. It has been confirmed that in fever the vitamin is used up in the body at a rate faster than normal, so that an increased intake of the vitamin may be desirable in convalescence. Particularly low values have been found among patients with a history of gastric and duodenal ulcer.

Various studies on diets are briefly summarized. Among other matters observations have been made on the effects of severe salt deficiency on the general well-being of normal persons, and particularly on the function of the normal kidney. It has been shown that one remarkable result of extreme salt deficiency is the reproduction in large measure of the symptoms and signs of Addison's disease. At the Lister Institute a study has been made on the influence of diet on reproduction in rats. The findings so far support the conclusion that the rate of parturition and the power to raise offspring can be increased by adding an extra ration of unsaturated fatty acids to a diet containing all the known essential factors.

Work on the subject of iodine and goitre has been directed by a special committee appointed jointly by the Medical and the Agricultural Research Councils. The results of this investigation, contained in a report already issued in the Council's series, are, briefly, that an environmental deficiency of iodine is related to the incidence of goitre. Two English counties, Somerset and Suffolk, have been taken for study. In the former the incidence of simple goitre is high and in the latter it is low. The iodine content of the waters of Somerset is consistently lower than that of the waters of Suffolk, though milk and pasture samples from the two counties show no significant differences in iodine content.

Various Work

Fruitful work is recorded on almost every page, but space limits us to mentioning only two or three more instances. At Cardiff City Mental Hospital an investigation has been started on the metabolism of acetylcholine. It has been shown that when slices of tissue from the brain cortex are supplied with oxygen in a medium containing eserine a substance, believed to be a choline ester, is formed which produces a powerful contraction of sensitized leech muscle.

In the field of chemotherapy earlier reports have mentioned the preparation of two arsenical derivatives which have been found to give promising curative results in experimental trypanosomiasis. A satisfactory process has now been devised for producing one of these on a suffi-

cient scale for therapeutic trial, and a preliminary trial on human patients is now in progress.

Work has been done at University College, London, on the properties of the aqueous and vitreous humours of the eye in relation to changes in intra-ocular pressure. It has been shown that although the vitreous gel is capable of turgescence the degree to which it can retain water in excess of normal is so slight as to make it impossible that such a swelling in itself could cause the symptoms of glaucoma. In glaucoma the salt concentration of the vitreous humour has been found to exceed that in the blood—a reversal of the normal state.

During the year the Council has issued two reports recording investigations on deafness, a quantitative study, and one on the relief of deafness by instrumental hearing aids. In the present report the importance of the study of deafness from the angle of prevention is urged. Some two and a half million people in this country suffer from some degree of deafness, and middle-ear disease is at the very top of the list of causes of rejection of Army recruits. A good deal of direct research on problems of hearing and on diseases of the ear is mentioned, but has not yet reached the conclusive stage.

In the field of genetics the medical staffs of a number of hospitals in London and the provinces have continued to co-operate with the committee of the Council concerned with this subject by supplying data for a large-scale statistical inquiry into the incidence of consanguineous parentage among patients suffering from different conditions. Owing to the rarity of such marriages much greater numbers of records are required before any conclusions can be drawn regarding the existence of defects due to recessive inheritance. At the Galton Laboratory Julia Bell has obtained two pedigrees illustrating linkage between two sex-linked diseases—haemophilia and colour-blindness.

In commenting last year on the loss to higher medical education caused by the withdrawal of the wider scheme of Rockefeller fellowships, the hope was expressed that it might be possible partially to fill the gap by augmenting the number of medical travelling fellowships from other sources. The award of such fellowships by the Rockefeller Foundation ceased with the academic year 1935–6, but the Council has been able to provide, in two cases from its own funds and in another by the kindness of the Leverhulme trustees, three new travelling fellowships in medical science. The three Fellows are now all working at centres in the United States. Research fellowships in tuberculosis have also been awarded for the present academic year to four persons, all of whom are studying clinical problems of tuberculosis at centres abroad.

G. Bini (*Arch. ital. Anat. Istol. patol.*, June, 1936, p. 270), who records three illustrative cases in patients aged from 20 to 53, made an examination of the endocrine system in two cases of Graves's disease and one of Addison's disease associated with hyperthyroidism. In the first and third cases the hypophysis showed only slight changes. On the other hand, in the second case a cyst which occupied the anterior lobe of the hypophysis reduced the active part of the parenchyma to a minimum, the eosinophil cells being affected most of all. In the first case the thyroid showed an adenoma accompanied by numerous colloid cysts, while in the second and third cases it had the appearance of a colloid goitre with the microscopical changes characteristic of Graves's disease. Nothing unusual was found in the other glands apart from complete caseous necrosis of both suprarenals in the third case. In the second and third cases the liver showed evidence of fatty degeneration, atrophy, and infiltration.

Local News

ENGLAND AND WALES

Manchester University's Appeal

On March 16, at a meeting held at the Town Hall, an appeal was made for financial support for the development and extension of Manchester University. A capital sum of £300,000 is needed, and new annual subscriptions to the extent of £10,000. Included in the proposed expenditures are: £35,000 on accommodation for the social sciences departments; £30,000 on the long-promised new medical library; £5,000 on a surgical research laboratory; £10,000 on extensions to the department of pathology and bacteriology; and £8,000 on provision for physical education. Including the gift of the dental hospital by Mr. Samuel Turner (reported in these columns on March 6, p. 523), subscriptions have been promised amounting to almost £150,000. Owens College was founded in Manchester in 1851, though the charter which made Manchester a separate university was not given until 1903. The history of the University is a distinguished one, and the magnitude of the plans for the immediate future is some measure of the strides which have been made in the last thirty years.

Marie Curie Hospital: Opening of Research Laboratories

Queen Mary, patron of the Marie Curie Hospital, Hampstead, opened on March 19 the hospital's new and enlarged laboratories, providing facilities for clinical and pathological research. The laboratories are named in memory of the late Dr. Helen Chambers, honorary pathologist to the hospital. Lord Dawson of Penn, who presided, welcomed Queen Mary, and, on behalf of those running the hospital, expressed gratitude for Her Majesty's interest in and encouragement of their work. He also welcomed Mlle Eve Curie, daughter of the late Mme Marie Curie, and Dr. Henri Coutard, director of the *x*-ray therapy department of the Curie Foundation, Paris. Lord Dawson reminded those present that just over forty years ago Mme Curie and her husband, while investigating uranium, discovered a new element, which they named radium. From that discovery proceeded a veritable romance of science. It was soon noted that a plate containing the minutest quantity of the new element, when brought into the vicinity of the skin, produced reactions. That led on to the treatment of human diseases by radium. Knowledge concerning the physics of radium was largely due to Englishmen, and thus the culture of France and the culture of England had brought extensive blessings to mankind. The Marie Curie Hospital was founded in 1929 for the treatment by radiotherapy of women suffering from cancer and allied diseases. Nearly 4,000 cases had passed through the wards. Of the thirty-nine beds twenty-nine were devoted to uterine cancer. As a result of treatment extending over five years as many as 85 per cent. of the cases taken at an early stage were free from the disease at the end of that period. Of the cases in which the disease was firmly established when treatment began 65 per cent. enjoyed freedom at the end of the five years. Even among those in whom the disease was far advanced when the patients first reached the hospital the results were encouraging and at times astonishingly so. The laboratories would stand as a memorial to Helen Chambers, would fill a gap in the hospital's work, and assuredly open a new chapter of increasing beneficence to both doctors and patients. Mlle Eve Curie said the hospital itself represented one of the realizations of her mother's hopes, though from its foundation Madame Curie regretted that the hospital had no research laboratory. The opening of the Helen Chambers laboratories would establish the balance between medicine and pure

science which Marie Curie considered indispensable to any institution in which radium treatment was given. British scientists had been among the first to acknowledge the value of M. and Mme Curie's scientific discoveries, and England was the first country to take a practical interest in those discoveries. Now hospitals for the treatment of cancer by radium existed in all the countries of the world. Dr. Coutard, in wishing the hospital and the new laboratories every success, said that the results already obtained by the Marie Curie Hospital were among the best achieved in any part of the world. Mrs. Walter Runciman, chairman of the Board of Management, offered thanks to Queen Mary for her presence, and added that the friends of Helen Chambers were raising a special fund to pay for the equipment of the laboratories, but between £4,000 and £5,000 was still required to complete the payment for the building of them. Among those present at the ceremony were the Polish Ambassador, Sir Cuthbert Wallace, President of the Royal College of Surgeons, Lord Horder, Sir Lenthal Cheatle, Professor Winifred Cullis, Miss Chadburn, Professor Sidney Russ, and Dr. W. E. Gye.

Treatment of Fractures

At a luncheon given in London on March 16 by the Industrial Welfare Society Mr. H. E. Griffiths, F.R.C.S., gave an address describing work in the treatment of fractures. Mr. R. S. Hudson, Parliamentary Secretary to the Ministry of Health, in moving a vote of thanks to Mr. Griffiths, said that in 1935 more than 1,300,000 accidents were treated at hospitals in Great Britain, and these included over 200,000 cases of fracture. Unfortunately, in the past many of these injuries had left the patients suffering in varying degrees from permanent incapacity and loss of earning power. Modern methods of treatment in special fracture clinics resulted both in a very much shorter stay in hospital and in a reduction of the after ill effects. It was for this reason that the Minister of Health and the Home Secretary had set up a committee under the chairmanship of Sir Malcolm Delevingne to consider the best arrangements for restoring the working capacity of the injured. Mr. Hudson then spoke of the interest taken in this problem by the Industrial Welfare Society. The society could exercise a powerful influence both through employers and through workers' associations. Industrialists were beginning to realize the enormous amount of personal suffering as well as loss of time and wages which resulted from these injuries and which could be reduced by modern methods. In some cases they had made substantial contributions to the cost of treatment. He suggested that groups of employers or workers who were contemplating action on these lines should put themselves in touch with the committee.

Royal London Ophthalmic Hospital

The annual dinner of the Royal London Ophthalmic (Moorfields) Hospital took place on March 11 at the Langham Hotel. Mr. T. Harrison Butler presided, and, in responding to the toast of the school, the dean, Mr. Charles Goulden, incorporated his report. He said that the school was flourishing, and that students had joined the hospital in larger numbers than previously. During 1936 104 new students joined the hospital and seventy-four old students continued their attendances. The examination results had been satisfactory. The Gifford Edmond prize had been awarded to Mr. J. Bruce Hamilton of Hobart, Tasmania (an old student and senior resident officer), for his essay on the "Significance of Heredity in Ophthalmology." Apart from continuous clinical instruction, 623 hours of lectures had been given. Mr. E. F. Fincham delivered a series of lectures on modern ophthalmic instruments, and Professor S. P. Bedson on allergy. Six series of demonstrations had been given to students of the British Post-Graduate Medical School at Hammersmith. Sir Stewart Duke-Elder had resigned from the hospital staff, and Sir John Parsons, who had lectured on physiology since 1919, had also resigned his lectureship. To replace these the school had secured the services of Dr. R. J. Lythgoe, Reader in Physiology of the Special Senses in the University of London. Dr. Russell Brain had retired, and in his place Dr. Denis Brinton had been elected to the staff. Mr. Frank Law had joined the staff and undertook the classes in practical surgery. Mr. C. D. Shapland had been appointed curator and pathologist and Mr. R. C. Davenport sub-dean. The school still felt the need of a proper professorial unit in which full-time officers could give more attention to the teaching. Under the present arrangement it was impossible to do more, and recently the help of chief clinical assistants had been obtained to give tutorial classes, and these had been much appreciated.

SCOTLAND

Edinburgh Mental Hospital

The annual report of the Royal Edinburgh Mental Hospital for Mental and Nervous Disorders by Professor D. K. Henderson, physician-superintendent, shows that 1,131 patients were treated during 1936 in Craig House and West House, of whom 378 were voluntary and 753 certified. The number discharged recovered and relieved was 140, including 103 voluntary and thirty-seven certified patients, while the deaths numbered ninety-three. In Jordanburn Nerve Hospital for milder cases there were 270 admissions, of whom 136 were discharged recovered and relieved, while four died. At nursing homes connected with the institution there were 130 admissions, of whom seventy-three were discharged recovered and relieved and eighteen died. An important aspect of the institution's work is the various out-patient departments. In this department of the Royal Infirmary 250 patients were examined and treated; at the Jordanburn Nerve Hospital there were 285 out-patients, and at the University Psychological Clinic 212. In every department of the institution the numbers had greatly exceeded those for 1935, and were likely to go on increasing. Jordanburn Nerve Hospital, which attempted to deal with incipient cases of nervous or mental illness, admitted patients whether they could afford to pay for treatment or not, and had proved of great benefit; this was an indication that further clinics of a similar kind were needed in other parts of Scotland. The report points out that when the legal statutes governing mental treatment were enacted psychiatry was in its infancy, with chaos and mismanagement in mental hospitals, and safeguards were necessary, so that the liberty and safety of the subject should be preserved. In Professor Henderson's opinion the time has passed for supervision and inspection of mental hospitals. A Government inspection of mental hospitals is no more necessary than of hospitals for fever, tuberculosis, or other diseases. At the present time, the report states, there are throughout the country nursing homes and clinics dealing with various forms of mental illness, which function satisfactorily without control by crippling legislation, and the extent to which they are used is the best proof of the confidence which the public places in them. Mental illness is largely a preventive problem, and in its incipiency should be dealt with in the free light of the community rather than behind closed doors. In 1935 there were in Scotland about 24,000 certified patients under treatment, not including the huge number of voluntary patients in mental hospitals, and the public expenditure approached £1,250,000 annually, yet much greater accommodation is required than is at present available. Great advances have already been made in ante-natal and infant welfare clinics, improvements in housing and nutrition, the school medical service, and specialized clinics and hospitals to deal with the physical and mental needs of the child. For the more adult population out-patient departments have been set up in connexion with general and special hospitals. All of these preventive agencies

could be more fully utilized if there was a co-ordinated medical service. Lunacy laws, however, smacking of superstition and witchcraft and totally out of keeping with present-day medical opinion, still governed the mental health service, but if a co-ordinated scheme between the latter and the general health service could be brought to fruition it would do more to empty mental hospitals, prisons, and poorhouses than anything in the past. The report also refers to the treatment of schizophrenia by hypoglycaemic shock induced by insulin. Dr. Pullar Strecker during the past year has treated a number of cases in this way, and it is evident that a certain amount of improvement occurred during the course of treatment, but it is not yet possible to say whether the results are permanent. The treatment consisted in producing a light or more severe coma by means of a graduated quantity of insulin, and the treatment was not altogether free from danger. The average duration of treatment had been from six weeks to two months.

Glasgow Mental Hospital

At the annual meeting of the Glasgow Royal Mental Hospital Dr. Angus MacNiven, physician-superintendent, said that the mental illness in a considerable number of recent admissions appeared to have been largely due to unsuitable employment. Economic and social conditions were not the most important factors in the causation of neuroses; even in cases in which external stresses appeared to have been the cause further investigation brought to light emotional difficulties of the individual which were of more fundamental importance. Study had revealed that certain forms of employment and certain conditions of work were factors in the production of mental illness, and it seemed reasonable to suggest that steps should be taken to protect the mental health of those affected by these conditions in the same way as the physical health of workers was protected in some dangerous trades. Legislation was required to control the adverse effect on mental health of certain types of employment in which the employee's income and security depended upon his producing a monthly or yearly progressive increase of business. The report showed that the number of patients admitted during 1936 was 201, of whom 104 were voluntary patients. The total number resident during the year was 736, and the average daily number 542. Sixty-five patients were discharged as recovered, forty-three as relieved, and fifty-seven died. The report also dealt with the work of the Lansdowne Clinic for Functional Nervous Disorders, which was managed from the Mental Hospital. This clinic had provided evidence of the importance of unemployment as a causative factor in psychoneurotic illness, and male patients had been more numerous than female because unemployment was greater among men. By the end of the year this clinic had been open for eight months, and during that time 186 patients had been treated—106 men and eighty women—and the total number of consultations had been 654. Out of eighty-seven cases in which treatment was finished forty-seven showed no improvement or the patient gave up attending, but in the remainder there was great improvement under treatment.

An International Cremation Congress will be held in England from September 24 to October 2, 1937. All the cremation countries of the world have been invited to send delegates. The working sessions of the congress, to be held in the Guildhall, London, will occupy September 24 to 26 inclusive, and the remaining period will be spent by the foreign visitors and others who so desire in tours of the provinces, where visits will be made to places of outstanding interest. A number of social functions will be arranged for the delegates in London, open to members of the congress only. Particulars may be had from the secretary-general, International Cremation Congress, 23, Nottingham Place, London, W.1. The membership fee is £1 1s.

Reports of Societies

NEUROLOGICAL SEQUELAE OF SPINAL ANAESTHESIA

At a meeting of the Section of Neurology of the Royal Society of Medicine on March 18, Dr. ANTHONY FEILING in the chair, the subject of discussion was the neurological sequelae of spinal anaesthesia.

Dr. MACDONALD CRITCHLEY said that, with few exceptions, the literature on this subject was by non-neurological writers, and the problem was without exact data from the neurological point of view. It was not even possible to say just how often neurological complications occurred; the figures available were contradictory. Certainly a significant number of nervous sequelae were overlooked, especially ocular palsies and lesions of the cauda equina. No scientific classification of the nervous sequelae was as yet possible, but he gave the following list:

1. Headache, severe and protracted, certainly the most frequent complication.

2. Sixth nerve palsies and other cranial nerve affections. These might include nystagmus, optic atrophy, paralysis of the seventh, eighth, and ninth cranial nerves together and lesions of the trigeminal, auditory, and also the hypoglossal nerves.

3. Lesions of the cauda equina and conus medullaris—quite common in his experience.

4. Radiculomyelitis and myelitis. In a small number of cases there was evidence of a widespread nerve process affecting a higher level. He had no personal cases of transverse or ascending myelitis, but such cases were on record.

5. Radiculitis.

6. Focal cerebral lesions.

7. Symptoms of latent neurological disease, precipitated by spinal anaesthesia—for example, disseminated sclerosis, progressive muscular atrophy, and spinal syphilis.

He also referred to the work of Spielmeyer, Davis, and others in the experimental production of spinal disease in dogs.

It would be folly to ignore the accumulating evidence that spinal anaesthesia might at times be followed by neurological sequelae, which, always disturbing in character, sometimes proved disastrous. The most serious feature was that no steps could be taken to avoid these nervous after-effects, for as yet their causation was unknown. Were some or any of them attributable to faulty technique, to errors in dosage, to unsuitable pre-anaesthetic or post-anaesthetic medication, or to nursing? How far was the drop in blood pressure a factor? What part was played by the anaesthetic substance itself? Were nervous sequelae commoner with one preparation than with another? Could it be that some or all of these nervous sequelae were due to the activation of a latent process by the lumbar puncture or the spinal anaesthetic? It was certainly time that neurologists exchanged their views.

Anaesthetic Technique

Dr. J. K. HASLER said that the giving of a spinal anaesthetic demanded two manœuvres on the part of the anaesthetist: first, a lumbar puncture must be performed; and, secondly, a drug must be introduced into the spinal canal. Each of these actions demanded attention in considering possible sequelae. He was convinced that the lumbar puncture itself was responsible for the majority of the troubles which followed spinal anaesthesia. Headache, for example, was known to follow diagnostic lumbar puncture. Points to consider were the size of the needle; with a finer needle the percentage of headaches was lower. The needle used should be properly shaped; any needle

with a blunt point should be discarded. He preferred to make his injection in the middle line instead of from one side. In the prevention and treatment of headache it was usual to keep the patient in the Trendelenburg position when returned to bed. A second complication of lumbar puncture was gross damage to the nervous tissue by the needle if the technique was imperfect. It occasionally happened when making a puncture that the patient felt a shooting pain down the hip; it was transitory, but it did not occur if the needle was kept strictly in the mid-line. The third complication was haemorrhage. However carefully the puncture was made there always seemed to be cases in which a blood vessel was injured. Was this likely to produce a haematoma with pressure effects? Turning to the question of the drug injected, Dr. Hasler pointed out that the most efficient anaesthetics were the most toxic. In the early days the commonest drug used was stovaine, and some cases of stovaine tabes occurred, but these were not referred to in later work, and possibly were due to faulty technique. The concentration of the drug was important. If a drug was used in a dilute form and had the effect of temporarily paralysing the nerve, the same drug used in greater concentration might easily turn the temporary paralysis into a permanent one.

Experimental and Pharmacological Considerations

Professor A. D. MACDONALD said that the introduction of a solution of local anaesthetic into the cerebro-spinal fluid in the lumbar region was easy in the cat and dog. The dilution of the injection had been followed for drugs of the procaine series by collecting small samples of cerebro-spinal fluid at intervals and estimating the concentration of drug colorimetrically. The absorption into the blood stream, the partial excretion in the urine, and the spread from the lumbar region to the cervical region and cisterna magna had also been followed. Provided the volume injected was not excessive such spread was surprisingly limited, and, within limits, the volume of the solution was a more important factor than the weight of drug injected in avoiding acute catastrophes. The concentration found in the blood was never significant, confirming the experimental and clinical evidence of the absence of danger on absorption as compared with the risk of spread to the phrenic roots or the vital centres or both.

The incidence of sequelae had been investigated in the cat, in which animal they were recognized by tail droop, symptoms referable to bladder and rectum, and sensory changes, using simple solutions of procaine hydrochloride and various proprietary solutions. Doses considerably in excess of the weight-for-weight clinical doses had to be used to get symptoms. The common constituents of solutions other than the drug—ethyl alcohol, glycerin, glucose, etc.—could be exonerated. Amylocaine (stovaine) appeared to be quite as likely as procaine to provoke sequelae. That the local anaesthetic drug rather than the needle was responsible for the sequelae was clear from the diffuse nature of the symptoms. Further evidence had been obtained by investigating the frequency of disturbances after the administration of 2½, 5, 10, and 20 per cent. solutions. The proportion of affected cats increased with the concentration of the drug injected.

Points in Aetiology

Dr. FERGUS R. FERGUSON described a series of thirteen cases with the neurological picture of a cauda equina lesion. These cases occurred in the eighteen-months period between August, 1933, and March, 1935, and followed heavy durocaine spinal anaesthesia. It was remarkable that such a number should have occurred within a short time, because a search of the literature had revealed only about sixteen similar cases. The ages of the patients ranged from 17 to 70; eleven of them were males and two females. Of the operations, eight were operations of urgency. The anaesthetic was heavy durocaine in all cases except one. The complications were severe in eight and mild in five. There were three deaths in this series, but none of them could be attributed directly to the spinal anaesthetic. Broadly, the neurological complications were absence of one or more of the leg tendon reflexes, retention of urine, incontinence of faeces, sensory loss in the sacral region, and loss of sexual function. During the period under review about 1,000 heavy durocaine spinal anaesthesias were given and about 1,000 stovaine, but the only complications were in these thirteen. Discussing some aetiological points, he said that he could not agree that any significant part was played by trauma. A novocain compound seemed to be suggested as the toxic agent; but why this large incidence after heavy durocaine? The possibility of the constituents of the solution other than the drug being incriminated had been considered; alcohol was viewed with some suspicion, but it scarcely seemed possible that the lesion could be due either to alcohol or to the glycerin. He suggested as the cause of this heavy incidence with durocaine that it was due to a combination of the drug with the alcohol and the glycerin leading to the undiluted procaine being too long locally in contact with the nerves; it did not diffuse rapidly enough.

Clinical and Pathological Experiences

Dr. W. RUSSELL BRAIN said that he had seen certain cases of cranial nerve palsies in which both the sixth, both the seventh, and both the eighth nerves were affected, but the patients recovered completely in about two weeks. He proceeded to give the clinical details of a case of neurological sequelae following spinocain. The chief point about it was the long latent interval before the neurological symptoms occurred. Pain was not felt until a week after the anaesthetic, and motor symptoms were not experienced until a month. In most of such cases he believed the paralysis had followed in the course of two or three days. The interval might have been an incubation period for a process of sensitization, and in these days the possibility of superimposed virus infection must be mentioned. This case had a fatal termination, and Dr. DOROTHY RUSSELL gave an account of the pathological findings. There was softening in the lower thoracic and upper lumbar segments. The characteristic finding was the necrosis of the whole substance of the cord in the lumbar region, complete in the grey matter and incomplete in the white. There was no evidence of direct trauma to the cord or of old haemorrhage, nor was there any evidence of the introduction of any infective agent at the time of puncture.

Dr. H. K. ASHWORTH said that the cauda equina lesions should be regarded as a dangerous group. Another dangerous category included patients who had an incipient disease of the nervous system, which was precipitated into activity by the administration of the spinal anaesthetic. Of the more transient lesions headache was much the commonest sequel. This occurred, often in a severe form, after diagnostic lumbar puncture, so that it was not the result of the drug. A German worker had published a paper based on an experience of many hundreds of spinal anaesthesias, and found no difference at all in the incidence of headache following the use of different sizes of needles, but he had found the incidence of headache to vary according to the age group, being more severe in younger and more highly strung persons. Patients who had been given spinal anaesthetics without their knowledge, after premedication, also developed headaches, so that the condition was not always a functional one. The German worker had advocated nitroglycerin as a remedy, but in the speaker's hands it had not been successful.

Dr. WILFRED HARRIS said that he had been accustomed to inject novocain in the sciatic nerve, and no permanent symptom whatever had resulted. He could not accept what had been said about the possibility of a direct effect of concentrated novocain. He suggested that the cause of the sacral lesions was the very strong vasoconstrictor effect. Dr. J. P. MARTIN mentioned a case of ascending

myelitis following a spinal anaesthetic. The patient first of all had symptoms of the usual sacral group and then numbness spreading upwards, and when he saw him, about a week after the anaesthetic, he had symptoms of high spinal lesion. About a day or two later he developed hemiplegia down one side and eventually down the other, and died. Dr. FEILING, from the chair, in closing the meeting mentioned certain cases recorded in literature: one of persistent paraplegia, by Dr. Langton Hewer, and two cases of temporary mania, by Mr. Dickson Wright, percaine being the anaesthetic used in all cases.

GASTRITIS

At a joint meeting of the Liverpool Medical Institution and the Manchester Medical Society at Liverpool on March 4, with Professor R. E. KELLY in the chair, Mr. R. L. HOLT read a paper on gastritis.

Mr. Holt said that for the past eighteen months he had been collecting fresh specimens of stomach following partial gastrectomy for chronic gastric ulcer. His histological findings had been substantially the same as those described by Konjetzny, Kalima, and Puhl, differing simply in degree, a change readily explainable on the difference in the pre-operative treatment existing in this country and in Continental clinics. In more than half his cases there had been naked-eye evidence of a subacute gastritis which was most marked in the pyloric antrum, but extended to a lesser degree into the duodenum and body of the stomach. On microscopical examination all his specimens had shown evidence of a subacute or chronic gastritis. The histological changes were distributed in a patchy fashion throughout the gastric mucosa, erosions alternating with areas of normal mucosa, hypertrophy, and atrophy. He suggested that in this country there was a tendency to stress the importance of the presence of a definite peptic ulcer and to neglect the larger number of cases which had all the signs and symptoms of peptic ulceration except *x*-ray evidence of an ulcer. There was no doubt that all the signs and symptoms usually associated with chronic peptic ulcer could be reproduced by a pyloric gastritis, and he quoted Faber, who had stated that the signs and symptoms were produced by the gastritis and not by the ulcer. He discussed the factors generally deemed of importance in the genesis of chronic gastric ulcer, and stated that in his view chronic ulcer might well be considered as a complication occurring in a case of pyloric gastritis. Most patients who consulted their practitioners on account of gastro-intestinal disturbances were still classified non-committally as dyspepsia of one sort or another. He hoped that the recognition of the frequent occurrence of gastritis and the signs and symptoms which it produced would prove to be a great step forward in penetrating this diagnostic fog.

Professor HENRY COHEN, referring to a query by the President, "What is indigestion?" feared that if certain current Continental ideas on gastritis were accepted the impetuous surgeon would not stay for an answer, but would proceed to partial gastrectomy. Such mutilation was, in his view, quite unjustifiable in the present knowledge of the subject. The condition of chronic hypertrophic gastritis had yet to be defined with much greater care, as also had the factors which played a part in its production and its relationship to gastric ulceration. It had been stated that gastritis almost invariably preceded ulceration and cancer of the stomach, but Church, Walters, and Wellbrock of the Mayo Clinic had shown that pyloric obstruction itself was a very important factor in producing gastritis, which was practically absent in cases of carcinoma of the stomach without pyloric obstruction, but was present in eleven out of twelve cases with pyloric obstruction. Many exogenous factors could cause inflammatory changes in the gastric mucosa—mechanical, chemical, thermal, and bacterial. Professor Cohen recalled that after Alexis St. Martin had been drinking "ardent spirits" for nearly a fortnight, Beaumont found characteristic changes of gastritis, including erosions. Atrophic gastritis with achlorhydria had been studied in much greater detail. Its association with hyper- and hypo-chromic anaemias, subacute combined degeneration of the spinal cord, certain types of polyneuritis, and steatorrhoea had been firmly established.

Mr. J. HOWELL HUGHES said that gastroscopy had revealed three types of gastritis: (1) the catarrhal, which showed change of colour of the mucous membrane from the normal orange to a deep red colour, often with submucous haemorrhages; (2) the atrophic, pale, flat mucous membrane usually seen in anaemias; and (3) the hypertrophic type, the pathological changes in which Mr. Holt had discussed. Similar changes were seen in gastroscopy—namely, tortuous and redundant rugae, small granulations on the rugae, sometimes small varicosities, and in some cases small acute erosions. In this type a certain rigidity of the mucous membrane was obtained, so that rugae which normally flattened with air distension were still present, and therefore it seemed as if a permanent change in the mucous membrane had taken place.

Mr. JOHN MORLEY said that, while it had been certainly proved that gastritis could be found in the mucosa surrounding gastric and duodenal ulcers in a large proportion of cases, there was insufficient evidence to determine whether this condition was a predisposing cause or a result of the ulceration. Where pyloric gastritis was present without gross ulceration it was impossible to detect it without opening the stomach (apart from previous gastroscopy); he felt some misgivings that, if ever such an intangible lesion came to be regarded as an indication for partial gastrectomy, a very valuable operation might fall into disrepute. With regard to the atrophic gastritis associated with achlorhydria, the difficulty was that the condition was very common, and increasingly so with advancing age, and as a rule gave rise to no dyspeptic symptoms. The claim sometimes made that atrophic gastritis was a common predisposing cause of cancer was entirely unproved.

EMOTION IN CHILDHOOD

At a meeting of the Medical Society of Individual Psychology on March 11 a paper was read by Dr. MARGARET LOWENFELD on the toddler and school child.

Dr. Lowenfeld said that with so wide a subject before her she was not attempting to deal with any of the detailed problems that arose during this long period of years but was instead going to make an attempt to touch upon certain basic principles of mental hygiene which were with modifications to be found in operation over the whole period of childhood. She first mentioned emotion in childhood, which differed from emotion as experienced by the average adult in three ways. The adult was accustomed to say "I am happy, I am sad," thereby exhibiting the fact that together with the emotion there was the consciousness of the self as experiencing the emotion. Only in panic, that overwhelming rage admitted as a defence by the French legal code in the *crime passionnel*, and in sexual experience did this not hold true for adult life; in these situations the "I" became blotted out by the emotion. Children, particularly very young children, found themselves constantly in this situation, for there was as yet no consciousness of a separate "I." The child in a rage to be rightly understood must be regarded as "a piece of rage." In the second place the adult in stating "I am happy" at the same time implicitly affirmed his awareness of the fact that there had been moments before and would be moments again of which this could not truly be said; his statement contained an awareness of time. Emotion in the child, on the contrary, was timeless, and while it persisted appeared to the child eternal. Finally, there were very few adult emotional states in

which the telephone bell went unanswered. There was always a part of the adult's personality, whether he was aware of it or not, ready to respond appropriately to habitual external stimuli. This also was not true for a child. There was no part of a young child able to respond to external stimuli while the rest of the child was swamped by emotion.

Indestructibility of Emotional Force

Another basic principle, Dr. Lowenfeld said, was the indestructibility in human beings of emotional force once aroused. She likened this to the law of the preservation of energy. A total physical organism was like a balance sheet: if the emotion generated could not immediately be seen in outward manifestation, it was none the less present, but its presence would be shown by evidence of conflict expressed in one of four ways—physical illness, educational failure, personality deviation, or delinquency. Dr. Lowenfeld then went on to emphasize the importance of language in the emotional development of the child. According to modern psychological findings it was probable that some sort of mental activity was present from the first day of life. The central difference between mental work carried out now and later in life was that, lacking both language and the ability to move about under his own steam and check up his findings by reality, these mental structures built up by the child had perforce to be entirely subjective and based wholly upon subjective data. Being, moreover, untestable by the child, they had that obviousness and self-evidence that all self-consistent theories have for the individual who makes them.

The watershed for mental and emotional health came between 8 and 11 years, when the child for the first time began to manipulate speech, not as a practical tool, as the monkey uses the stick to procure for himself the banana skin, but as a medium for the expression of thought. Upon a child's reaction to this situation the speaker believed that the general character of a child's later development depended. Several typical contrasting reactions were described, and the help that can be given to a child at this stage was outlined.

Dr. Lowenfeld then went on to consider the question of emotion in itself, and declared her belief that emotion, like the other two aspects of organic human life, the physical and intellectual, had a morphology of its own; that it could and should pass through certain definite stages in its progress to maturity. Some of these stages were touched upon, and it was pointed out that for proper development at each stage certain elements in the environment were essential. These elements were difficult to obtain or were actually missing altogether from many city children's environments. She held that it should be the set aim of much of education artificially to supply what civilization had removed, and drew attention to the heartening success of several experiments in this direction in certain L.C.C. infant schools. She pointed out that if this scaffolding for growth were lacking, emotion remained at a more backward stage than the intellectual development of the individual, and tended to express itself as illness, psychoneurosis, or delinquency. Cases were described in illustration of children showing these complaints and indicating how analysis of the case from this point of view and treatment on these assumptions resulted in reorientation of the individual to life, with consequent gain in health, and emotional and mental vigour.

Finally, as a special illustration of the above principle, practitioners were warned to use caution in accepting the label "general debility," and advised instead, when all causes of organic disease had been carefully eliminated, to look for a persistent emotional maladjustment of an obscure nature as a cause of the persistence of chronic ill-health. The child's view of many necessary and routine medical procedures as an attack upon his own weakness was described and ways suggested of getting round this difficulty. The general importance of not overlooking the emotional aspect of disease in childhood was stressed.

PATHOLOGY OF ARTERIAL THROMBOSIS

At a meeting of the Pathological Society of Manchester on March 10, with Dr. T. H. OLIVER, the president, in the chair, Professor E. D. TELFORD delivered an address on "The Pathology of Arterial Thrombosis."

Professor Telford excluded from his review those cases in which thrombosis followed injury or embolism and confined his remarks to thrombosis consequent on disease of the arterial wall. Although thrombosis was of great clinical importance and often contributed to the final catastrophe, it was from the pathologist's standpoint merely an incident supervening after months or years of alteration in the vessel walls. It was possible on clinical grounds to establish a rough division of arterial disease into spastic and toxic. The chief members of the spastic group—the vascular complications of cervical rib and the Raynaud phenomenon—were responsible for thrombosis by causing damage to the arterial wall through compression and spasm of the vasa vasorum. Sections of arteries and arteriographs were shown in support of this view.

In regard to the toxic group the speaker devoted some time to an account of the various theories advanced to explain thrombo-angiitis obliterans. He discussed more particularly the possible occurrence of this disease in horses and laid some stress on the resemblance of the clinical findings in thrombo-angiitis obliterans to those described in epidemics of gangrenous ergotism. For arteriosclerosis the term "atherosclerosis" was considered preferable, since the latter not only implied that the condition was compounded of two pathological processes—atheroma and sclerosis—but also covered the occurrence of the lesion in veins, instances of which were shown on the screen. Professor Telford concluded by the observation that defects of nutrition of the medial coat by spasm or obliterative disease of the vasa vasorum might supply a clue to the medial calcification.

Correspondence

The Case for Pasteurization

SIR,—It was with much interest that I read of the Poole Corporation Bill, which seeks to provide, among other things, for the compulsory pasteurization of milk for human consumption (*Journal*, March 13, p. 571). The Corporation of Poole and their medical officer of health, Dr. R. J. Maule Horne, are to be congratulated for their progressive outlook in seeking legislation on this important subject. Those of us who realize the great benefits which can accrue from efficient pasteurization will hope that their endeavours may meet with success. They have certainly chosen a propitious moment in which to put forward their claims to be rid of the raw milk menace to the public health within the confines of their borough.

In submitting the case for pasteurization it is to be hoped that mechanical bottling will also be given consideration as being a most important and necessary factor in avoiding a possible subsequent infection of the milk. During the Chelmsford outbreak of milk-borne scarlet fever in August to September, 1935, an examination of throat swabs from employees at the dairy distributing the infected milk revealed that eight out of seventeen of the employees were themselves infected with *Streptococcus pyogenes* type II, this being the organism which caused the outbreak. Although the originating source of the infection was proved to be a milker at a certain farm supplying milk to the dairy, it is quite probable that some additional infection had been occurring through the medium of these infected employees prior to their detection. Therefore it may well be appreciated that

however efficiently the pasteurization has been carried out all this good may easily be undone if the milk is infected during the bottling. Thus I would submit that in advocating pasteurization we should always for similar reasons require and associate with it some form of mechanical bottling process.—I am, etc.,

Chelmsford, March 16. J. L. MILLER WOOD.

Accident and Diabetes Mellitus

SIR,—It is generally accepted that the bruising of tissues leads to the production of a toxin which upsets the metabolism of diabetic subjects, just as do the toxins elaborated by some bacteria and viruses, and therefore accidents cause an exacerbation of diabetes mellitus. The object of this letter is to ask the assistance of the medical profession to solve the question whether accident can initiate diabetes mellitus in the same way as it is asserted that trauma can cause malignant disease or local tuberculosis. A number of diabetic patients date the onset of their disease from an accident, but in only a small percentage of cases can previous glycosuria be excluded. I should be very grateful to those who send me brief notes of patients who were free from glycosuria and the symptoms of diabetes mellitus before an accident, and have developed glycosuria with or without symptoms following an accident, however trivial. The records of the London Hospital furnish some cases, but not sufficient to permit one to make a dogmatic statement.—I am, etc.,

London Hospital, E.1, March 19. O. LEYTON.

"Blood-sugar Worship"

SIR,—Dr. Guy Bousfield (*Journal*, March 20, p. 636) raises a pretty point in his criticism of Dr. Himsworth's statement (March 13, p. 542) deploring the practice of occasional estimations of the blood sugar to the exclusion of frequent and systematic examinations for glycosuria in the treatment of diabetics. He says: "Are they to be allowed to run high blood sugars throughout the day as long as they remain free from ketosis and glycosuria?" Surely the answer is yes, for how few diabetics are consistently sugar-free? The symptomatology of diabetes is dependent on ketosis and glycosuria, and is there any evidence that a high blood sugar *per se* is in any way detrimental? The aim of treatment is to produce a level blood-sugar curve below the renal threshold and yet not verging on hypoglycaemia. Severe diabetics with a high renal threshold are notoriously unstable and generally intolerant to the "normal" blood sugar. If their blood sugar is lowered so that the maximum during the twenty-four hours is much below the renal threshold their minimum too often verges on hypoglycaemia.

One blood sugar a day tells very little and is too often misleading. Three well-chosen blood sugars will give one a shrewd idea of the minimum, but tell nothing of the daily sugar curve. If on the other hand the patient is told to empty his bladder every three hours, in the presence of glycosuria one can gauge the curve of his blood sugar. During stabilization this has the additional advantage that the fluid intake must be increased in order to obtain frequent specimens, thereby combating any tendency to dehydration. I am sure that Dr. Himsworth's statement points to the goal which we too frequently miss because we have lost perspective in our worship of the blood sugar.

It is too changeable a factor for standardization, for will it not vary with the whim of the minute? The kidney is a much better judge than the test-tube, and if we must have the fetish of figures why not return to Gerrard's method of urine-sugar estimation and reserve the blood sugar for the rare occasion?—I am, etc.,

OLIVER WALKER.

St. George's Hospital, London, S.W.1, March 22.

The Birching of Children

SIR,—I hope that the leading article on the birching of children in the *Journal* of March 20 will attract attention and will stimulate the members of our profession to express their condemnation of this barbarity. It must come as a shock to many to realize that such treatment can by law be meted out to a child of the tender age of 8. Anyone reading the revolting details of a judicial birching must surely come to the conclusion that irreparable damage, both physical and psychological, is the inevitable result. The mentality of the flogging brigade in the House of Lords is well illustrated in the two instances quoted in your article. One noble lord, with striking originality, quoted Solomon's well-worn opinion on the rod and the child, and thereby suggested that England in the twentieth century should be governed by the ideas of an oriental Sultan who lived hundreds of years before the Christian era. Another quoted a case of sheep maiming, for which he thought flogging an appropriate punishment. Had his lordship possessed the merest smattering of elementary psychology (though perhaps this is too much to expect from our hereditary legislators) he would have known the meaning of that abnormal behaviour, and would have known also that punishment of a sadistic nature was the worst possible treatment.

If my Division supports me I shall hope to submit a resolution to the Annual Representative Meeting on this subject, as it is one upon which the medical profession is well qualified to express an opinion. We are proud of our English laws, but I question if we ought to be as long as they include enactments more suggestive of mediaeval Russia than of England to-day.—I am, etc.,

Hove, March 21. W. N. MAPLE.

Maternal Death Rate in Glasgow

SIR,—In the *Journal* of March 13 (p. 579) there is a report, for which I was not myself responsible, of remarks I made at the annual meeting of the Glasgow Royal Maternity and Women's Hospital. May I be allowed to correct an unfortunate mistake in this report in quoting statistics of the outdoor maternity services of the hospital: in the last five years there have only been twelve maternal deaths in all, not twelve per annum as stated in the *Journal*; this is equivalent to an annual maternal death rate of 0.5 per 1,000. In view of unfair criticism of the outdoor services of maternity hospitals made recently during the Committee stage of the Maternity Services (Scotland) Bill, it is important that the actual results of such services shall be accurately known.—I am, etc.,

The University, Glasgow, March 19. D. M. BLAIR.

Psychiatric Clinics

SIR,—I read with great pleasure Dr. Gillespie's letter (*Journal*, March 13), pointing out the need for close affiliation of psychiatric clinics with teaching hospitals. The benefit to patients, staff, and students of actually making the clinics part of the general hospitals, as is done on the Continent and in America, has appeared to us at St. George's Hospital to be indisputable.

It is precisely for the reasons so excellently set forth in his letter that the lay and medical authorities have decided that the new hospital of about five hundred beds

to be erected at Hyde Park Corner shall contain a psychiatric unit of, if possible, some fifty beds. The doubt as to size is a financial one, but we believe that the public will readily subscribe for a scheme which is so logical and for which all thinking people must realize the urgent need. I am happy and proud to be able to assure Dr. Gillespie that St. George's Hospital, when rebuilt, means to lead the way in putting his important suggestion into effect.—I am, etc.,

M. F. NICHOLLS,
Dean of the Medical School.

St. George's Hospital,
March 16.

Typhoid Abscess

SIR,—In view of the very interesting clinical memorandum in the *Journal* of January 30 (p. 219) by Drs. P. Phillips and R. T. Cooke, describing the development of a typhoid abscess fifty-seven years after the original infection, I should like to record a similar case in which the peculiar situation of the abscess gave rise to considerable difficulty in diagnosis.

The patient, a woman of 52, complained of the sudden appearance of swelling of the right side of the neck on March 28, 1936. A diffuse tender mass was palpable in the region of the right lobe of the thyroid, extending deep to the sterno-mastoid; the most probable diagnosis was thought to be haemorrhage into a thyroid cyst. Routine examination showed sugar and acetone bodies in the urine; subsequent blood-sugar estimations proved this to be due to true diabetes. The patient stated that she had been in good health since a severe attack of typhoid in 1906.

The swelling increased considerably in size during the three days that the patient was under observation, and was explored under general anaesthesia, using the usual collar incision on May 31. After division and retraction of the platysma and pretracheal muscles a finger was inserted along the lateral aspect of the right lobe of the thyroid; there was an immediate flow of creamy pus, the abscess cavity apparently lying between the deep surface of the sterno-mastoid and the thyroid. The latter organ showed no cyst or other abnormality. The wound was closed with drainage through its right lateral extremity and through a separate stab wound above the sternum. Culture of the pus gave a pure growth of *B. typhosus*.

Convalescence and healing of the wound were uneventful, and the diabetes responded rapidly to dietetic and insulin treatment. A radiograph of the cervical spine showed slight osteo-arthritis, but no typhoid or tuberculous vertebral involvement.

—I am, etc.,

A. C. MACONIE, M.B., F.R.C.S.

Shanghai, March 1.

Prostatectomy

SIR,—I am grateful to Mr. W. W. Galbraith (*Journal*, March 20, p. 638) for his endorsement of the views I published in the *Journal* of March 13 (p. 581), and for his acceptance of some general suggestions in the spirit in which they were offered. His appreciation of the work of the late Mr. Harris will be welcomed.

Mr. W. K. Irwin (March 20, p. 639) sticks to his guns with admirable fortitude, but fires them indiscriminately at too many targets. Incidentally he misinterprets my letter and draws erroneous conclusions.

1. He writes as if I claimed to be an authority on the Harris method of procedure. The honour is unmerited. My experience is limited, but sufficient to justify my belief that in selected cases, and always provided the pre-operative and post-operative care insisted upon by Harris is respected, the operation may be the ideal one. Mr. Irwin asks, if I cannot eliminate haemorrhage and sepsis, "what are the advantages he claims for the operation?" May I ask why he omits the qualifying paragraph? This is what I said: "I sometimes fear the very complications which Harris was able to eliminate—haemorrhage and sepsis—in the absence of a suprapubic drain. *Unless* [the italics are mine] there is unremitting vigilance after operation and personal attention is given with unceasing regularity these disasters may occur." I am sorry Mr. Irwin has been the one to heap obloquy on the achievements of a great pioneer.

2. I suggested that the type of operation should vary in accordance with the surroundings. Mr. Irwin "cannot imagine any surgeon of experience undertaking a prostatectomy outside a hospital or nursing home." I have never done so. There are additional surroundings.

3. I am taken to task for suggesting that the type of operation should fit the individual case. In a tone of reproof Mr. Irwin says I convey that I "can evaluate the patient's power to withstand a certain operation." This is one of the fundamental duties of the "operating physician." Judgement is the pivot upon which modern surgery revolves.

4. Mr. Irwin believes that what is good for the "bad risk" is also good for the "good risk." Few, I think, will adopt this maxim.

5. I ventured to say, "when the gland is removed and the cavity visualized it may be obvious that the wisest course is to leave well alone." Mr. Irwin concludes from this that my "technique often makes a long operation—which must severely tax the patient's strength and imperil the oulook." My words bear the opposite meaning. If Mr. Irwin contends that to even look at the prostatic cavity is perilous he must have no regard for the advances of recent times. Whatever the method adopted the results of prostatectomy will vary, but my last case in Southend Hospital was dry and passing urine normally in ten days. The cavity was visualized; it was decided to leave well alone. Open suction and admirable nursing did the rest.

6. In advocating open suction after an experience of twenty years (not ten as erroneously stated in my letter) I mentioned that it was difficult to prove, but that I was convinced *inter alia* that it lowered the incidence of post-operative haemorrhage. "This is illogical," says Mr. Irwin, "to say the least of it." Strict logic may be as devastating to the progress of surgery as microbic infection, but if Mr. Irwin will give suction a fair trial he will find it is not only logical but satisfactory in the manner I have indicated.

Mr. Irwin concludes with laudable concern for the populace. He rightly condemns the surgeon who cannot separate the good from the bad, and refers to him as a danger to the community. On this we are all agreed. My plea was not only to separate the good from the bad (especially the patients), but to do so with a sense of balanced judgement. In his original communication Mr. Irwin makes a good case against the abandonment of the old two-stage operation. He differs from most others in making it the rule and not the exception. He advocates speed as a routine, "the preliminary cystotomy or actual prostatectomy usually took only a few minutes." Speed is sometimes a fickle friend, indispensable at times, but a legacy of bygone days. Cushing and his disciples showed us the daylight in avoiding speed in brain surgery. Rapidity in abdominal surgery (unless specially indicated) is under critical review. Moynihan did not spare those who operated with "one eye on the clock." In the same sense he alludes to "brilliant surgery . . . such art has its proper scope in tricks with cards, juggling with billiard balls, and nimble encounters with bowls of vanishing goldfish."—I am, etc.,

W. I. DE C. WHEELER.

London, W.1, March 21.

SIR,—After reading Mr. Walter W. Galbraith's second letter (*Journal*, March 20, p. 638) I really fail to understand what he does advocate. For instance, in his first letter (February 27, p. 472) he states that the Harris method is "a tremendous advance" on the Thomson-Walker technique. Yet in his second letter

he tells us that in some cases he "would use the method advocated by Sir John Thomson-Walker."

As to results of treatment he is equally difficult to understand. In his letter of February 27 he states: "The Harris wound heals by first intention." Yet three weeks later, in his second letter, he tells us: "It would be wrong to say that after every Harris operation the wound remains absolutely dry when the catheter is removed."

Mr. Galbraith tells us that the result of the Harris operation depends almost entirely on the preliminary treatment, and says that, as regards the patients operated on at St. Paul's Hospital by the late Mr. Harris, he "would need to be assured that in the cases mentioned Mr. Harris had complete control of the preliminary treatment before apportioning any blame for results which did not attain to the high standard he himself set." I can assure Mr. Galbraith that Mr. Harris had complete control of the preliminary treatment in both cases, and that neither healed by first intention. In fact, one of the patients was in hospital for sixty-eight days. Yet Mr. Galbraith tells us that one of the most important points in favour of the Harris operation is "the prompt healing of the abdominal wound."

Mr. Galbraith has stated that my whole paper "bristled with misstatements (to call them nothing worse)." He has now written two long letters and has not produced any evidence of any misstatements. I note that Mr. Galbraith ends his second letter by stating that "premature judgement, above all things, is to be deprecated." —I am, etc.,

London, W.1, March 22. W. K. IRWIN.

*** This correspondence is now closed.—ED., *B.M.J.*

British Association of Radiologists

SIR,—All radiologists must, I am sure, thank you for your annotation on radiology in its relation to medicine (*Journal*, March 13, p. 564). The British Association of Radiologists, and in particular its Fellowship Board, should also be grateful to you for your approval of its efforts in the direction of establishing a higher diploma in radiology.

It is proverbially accounted ungracious to look a gift horse in the mouth, or even to appear to glance in that direction. Nevertheless, I trust you will bear with me when I say that your annotation rather leaves radiotherapeutics in the cold, whereas, in fact, the association is as much concerned with it as with radiodiagnosis. When the Fellowship Regulations were being drawn up it was recognized that in large cities there is some tendency for radiologists to devote themselves more or less exclusively either to radiodiagnosis or to radiotherapeutics. For this reason a candidate for the Fellowship is required to choose one or other subject in which to offer himself for examination on an honours standard. If he chooses radiotherapeutics he will be required to pass a modified examination in radiodiagnosis in which importance will be attached to radiographic interpretation, especially in relation to history and clinical signs. As regards the scope of the examination in radiotherapeutics you will perhaps allow me to quote a relevant paragraph from the official guide for candidates:

"The candidate may be examined upon the use of radiation in any morbid conditions where its value has been established. It is particularly to be borne in mind that knowledge confined to the use of radiotherapy in malignant disease will not satisfy the Board. Nor will purely technical knowledge be regarded as sufficient: a general knowledge of the conditions under treatment, including their aetiology, pathology, and symptoms, and of therapeutic possibilities outside radiation therapy, will be required. The expression 'Radiation Therapy' is defined in the Fellowship Regulations (40, xii, *e*) as 'Treatment by *X* Rays, Radium, or other forms of Radiation.'"

After this year certificates to the effect that they have had special experience in radium work will be required from candidates. In former issues of the *Journal* complaint has been made by correspondents that radiological diploma courses are not sufficiently concerned with treatment. I express no opinion on this point, but I do wish to call attention to the fact that the association is making a serious attempt to establish a diploma which shall guarantee a very high standard of attainment in whichever subject is specially chosen by a particular candidate, and that the test will be no less searching should he choose radiotherapeutics rather than radiodiagnosis.—I am, etc.,

F. HERNAMAN-JOHNSON,
Warden.

Fellowship Board, British Association of Radiologists, London, W.1, March 16.

Prevention of Silicosis

SIR,—Dr. S. C. Blacktin (*Journal*, March 13, p. 586) has been good enough to take me to task for my remarks with regard to adsorption by coal particles. If coal is a microbiological growth, as suggested by myself (1935) and others, then it is only natural that it will adsorb dyes in the manner mentioned by Dr. Blacktin, just as would any other similar material, but one would expect the adsorption to be of the order of monomolecular thickness, not of particles, such as would be ingested into the lungs during breathing. Through the courtesy of Dr. W. R. Jones I have been able to examine a specimen of a silicotic lung from a South Wales coal-miner, and there is obviously no adsorption of the type suggested by Dr. Blacktin. Moreover, if such adsorption did occur, it is equally obvious that silicosis should not be prevalent in the South Wales coal-fields.

With regard to the possibility of iodizing the air in which those subject to silicosis are working I would draw the attention of your readers to the fact that it has been seriously suggested that human beings derive their iodine from bacteria ingested in the lungs (Gmelin, 1931). I do not accept this theory, but before attempting to iodize the atmosphere as a germicidal precaution I would suggest that some experiments be carried out to discover the toxic dose of iodine to human beings and to micro-organisms in the air, otherwise it is possible that the cure may be worse than the disease. A more practicable method would probably be found to lie in the use of ultra-violet light, since ultra-violet light employed in moderation is beneficial to man, though deleterious to micro-organisms.—I am, etc.,

London, W.C.1, March 15. THOMAS MCLACHLAN.

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Death Following Blood Transfusion

SIR,—Those of us who practise blood transfusion are likely to be disturbed considerably by the fatal cases recorded by Dr. N. S. Plummer (*Journal*, December 12, 1936, p. 1186) and Dr. F. Pygott (March 6, p. 496).

In about 250 transfusions I have had only one fatal case, in a patient who died some ten days after the transfusion from what was proved to be renal blockage with acid haematin due to a delayed agglutination effect (May 5, 1928, p. 754). In repeating the cross-agglutination

(patient's serum against donor's cells) it was found that no less than sixty-five minutes were taken for agglutination to occur, and it has ever since been my practice, whenever possible, to allow at least one and a quarter hours for the cross-test.

My object in writing this letter is to inquire whether sufficient time was allowed in these fatal cases for a serum weak in agglutinating power to act fully. These low-titre sera are probably not so rare as one would expect. I am unable to appreciate the suggestion of anaphylaxis as a cause inasmuch as anaphylaxis should be impossible with two bloods of the same species, but a toxic anaphylaxis is perhaps implied? Incidentally, to prevent renal blockage the prior use of sodium citrate to render the urine alkaline will convert a potential renal blockage into a harmless haematuria.—I am, etc.,

A. GEOFFREY SHERA, M.A., M.D.,
Hon. Pathologist, Princess Alice Memorial Hospital, Eastbourne.

Eastbourne, March 8.

Normal Labour Under Analgesia after Temporary Sterility

SIR,—The following case of temporary sterility followed by a normal labour under modern methods of analgesia presents points which may be of general interest, the patient being herself qualified and in medical practice.

At age 34, after five years' married life, she was admitted to hospital for lipiodol injection and *x* rays; the first showed tubes of abnormal outline and doubtful patency, and three small opacities in the position of the left ovary. The second injection under greater pressure appeared to open up the tubes, and the radiograph showed lipiodol in the peritoneal cavity and the outline of a dermoid cyst, the three opacities being teeth. The potential risk of torsion and possible effect as a deterrent to pregnancy were considered adequate grounds for removing it. The cyst was found to be inseparable from the left ovary and the mass was removed *in toto*; a blood cyst was excised from the right ovary, whose covering was abnormally thick; and a pathological appendix was removed at the same time.

Five months later two injections of 1 c.cm. antuitrin S were given at intervals of thirty-six hours at the beginning of a menstrual cycle; the second produced distressing symptoms suggestive of hypoglycaemia but not the desired result. Six months later again four injections of 1/4 c.cm. were given at intervals of three days, and pregnancy occurred the following month.

A first labour at 36 in a patient with a history of rickets in childhood and only moderate muscular development suggested careful watching in the later stages of pregnancy, and Caesarean section was discussed; however, the child's head engaged satisfactorily and labour was allowed to proceed naturally, although its onset occurred a fortnight after the expected date. It began at 3 a.m. with a show, and the membranes ruptured at 11.30 a.m.; but pains were not evident until five minutes after an injection of pitocin at 12.30 p.m. At 2.30 they were beginning to be uncomfortably strong, and thenceforth until the end of the first stage the patient inhaled 30 per cent. N_2O in air from a Siebe Gorman apparatus at every pain. For five and a half hours this gave complete relief without affecting the frequency or effectiveness of the uterine contractions; and between pains she was able to read, and even to enjoy a tea-party. At 5 p.m. there was barely one-finger dilatation. At 8 p.m. the pains began to be so strong as to occasion some discomfort even with the apparatus in action; nevertheless the time seemed to her to pass very quickly as she slept between pains. At 10 p.m., the beginning of the second stage, gas, oxygen, and ether were given by an anaesthetist, at first intermittently; this was less satisfactory as, owing to the degree of pain needed to wake her from the anaesthetic administered during the previous contraction, she had not time to warn the anaesthetist of the onset of the next one and consequently felt each "pain" acutely; and she found the ether very unpleasant. So she was, after a short while, kept under continuously, and the baby, a girl weighing 9¾ lb., was born at 12.20 a.m. Forceps were used rather to control the head prior to crowning than because tractive assistance was needed. There was no damage whatever either to mother or child. The mother had remained lying down throughout labour; she did not even brace her feet against the foot of the bed and pull on a towel or "bear down." She did, in fact, nothing but inhale the analgesic at every pain. Twelve hours later she was sitting up in bed enjoying a good meal, and feeling perfectly well, without any stiffness or discomfort whatever.

To sum up, the points of note are:

1. An unsuspected dermoid cyst, diagnosed solely by *x*-ray (possibly the first occasion on which this has occurred).
2. Pregnancy following its removal and injections of antuitrin S. (There is of course no proof of cause and effect.)
3. The very rapid recovery by a primipara of 36 with only moderate muscular development from the birth of a 9¾-lb. baby involving twelve hours of strong and frequent pains after premature rupture of membranes.

While admitting the unwisdom of generalizing from the particular, one is tempted to attribute (3) to the very effective analgesia available, and suggest that the wearing effect of long-drawn-out severe pain in unrelieved labour plays a large part in the exhaustion which too often follows. If there is any truth in this the relief of that pain becomes not a sentimental gesture undertaken from humanitarian motives but a bounden duty incumbent on all of us who are engaged in the effort to reduce maternal mortality and industrial disability.

I am indebted for permission to publish details of this case to Mr. L. C. Rivett, who conducted it throughout. I enclose my card, but the patient being my wife I ask you to suppress my name.—I am, etc.,

M.A.CAMB.

Radiograph or Skiagram

SIR,—I am in complete agreement with Mr. R. S. Lawson's letter on this subject, even to the extent of believing that the public and the profession will go on calling a skiagram an "*x*-ray." But skiagram is the word. On April 1, 1896, I exhibited at a meeting of the Obstetrical Society of London a "Skiagram of a Sireniform Monster," and published it in volume 38 of the society's *Transactions* (for 1896, p. 118), more than three years before the earliest mention of the word in the *New English Dictionary* (*Athenaeum*, September 2, 1899).—I am, etc.,

London, W.1, March 20. HERBERT R. SPENCER.

Why "Nocifensor" System of Nerves?

SIR,—Another barbarous expression is apparently being added to the many for which classical scholars accuse us. The correct form of the new word is *nocufensor*. Nocifensor is as wrong as dociment, innocious, or moniment, since for verbs in -eo the compounding stem ends in -u. I called attention to this fact years ago, when the shocking compound anoci-association was put forward instead of innocu-association.

Would it be possible for Sir Thomas Lewis to withdraw his term and substitute the correct form, nocufensor? For purposes of medicine one term may be as useful as the other, but in the eyes of our critics—the classical scholars—nocifensor is as dreadful as the howlers in medicine, appearing in ordinary advertisements, are to us medical men.—I am, etc.,

Shepton Mallet, March 11. F. J. ALLEN, M.D.Cantab.

Abortion in France

SIR,—The views of Dr. Paul Balard, which you have usefully summarized in an annotation (March 20, p. 621), show, when worked out, that about 21,000 women die annually in France from criminal abortion. The repressive measures against birth restriction have proved worse than futile, yet he proposes more of them. Moreover, if they were to achieve the miracle of being effective they would raise France's birth rate to 30 per mille and her death rate to over 25. In England we fortunately have Professor Carr-Saunders and other leading sociologists urging that voluntary parenthood must be the basis of a satisfactory population policy. I contend that there will be a great amount of involuntary parenthood until abortion is made available to any mother of two children—unless it were possible and preferable to induce people to get sterilized when they have as many offspring as they can provide for. You rightly advocate that early marriage should be made easy and attractive, but this could only be financially possible if my eugenics idea were carried out of alone paying for the children of the first two effective confinements.—I am, etc.,

London, S.W.15, March 20. B. DUNLOP.

Obituary

JOHN ATTLEE, M.A., M.D.

John Attlee, who died on March 8 at Wellingborough at the age of 67 years, was a successful practitioner from 1895, first in Brook Street, W., and then for many years in Grosvenor Street, W. Matriculating at St. John's College, Cambridge, in 1886, he was in 1889 placed, together with the late A. S. F. Grünbaum (Leyton), afterwards professor of pathology at Leeds, in Class II of the first part of the Natural Sciences Tripos. In October of that year he entered the medical school of St. Bartholomew's Hospital with the Shuter Scholarship, founded in 1886 in memory of James Shuter for Cambridge medical students and awarded for anatomy and physiology. Qualifying in 1892 at the Conjoint Board and M.B., B.Ch. Cambridge, Attlee was ophthalmic house-surgeon and external midwifery assistant at the hospital, and house-surgeon at the East London Hospital for Children. Like many other men at St. Bartholomew's, he came under the inspiring influence of A. A. Kanthack, the first whole-time teacher of pathology in a London medical school, and in his laboratory carried out an experimental and pathological research into the adrenal cortex; this formed the substance of his thesis for the M.D. degree, and was published in the *Medical Chronicle,* Manchester. After entering practice Attlee kept in touch with hospital work, being clinical assistant at the Westminster Ophthalmic Hospital and on the staff of the Hospital for Consumption, Margaret Street, W. He was a fine figure of a man, cheerful, able, radiating kindness and confidence, and with many friends and patients. He was a member of the British Medical Association for twenty-five years.

Dr. Lewis G. Glover writes:

In Dr. John Attlee there has passed away one of the best type of practitioners: he was a man devoted to his profession and interested in every advance made during the years which have elapsed since he qualified in 1892. I first knew him at the beginning of our Cambridge days, and having once made each other's acquaintance our friendship has never slackened throughout. Though in later years we only met occasionally, the same kindly smile greeted one, and the same readiness to talk over old times and compare notes and experiences was there as always. We began our studies together, and we went through our whole course together, and I shall never forget the value and help to me which it was to have such a kindly friend. His genial nature endeared him to all who knew him, and he was in consequence one of those about whom one never heard an unkind or harsh word of criticism. I cannot speak of his relations with his patients beyond saying that I am sure he was beloved by all. He did his duty to all, without any push or self-assertion. Such men as he are the backbone of the profession; when they arrive at their well-earned rest we recognize that we are losing from the profession something which is not so easily to be replaced in these days of change.

Dr. T. Wilson Parry writes:

I would wish to add a brief tribute in connexion with the decease of my old friend John Attlee, not so much respecting his professional attainments but rather as to his character. We were at Amersham Hall School together over fifty years ago, and, as Wordsworth tells us, "The boy is father of the man," so Attlee as a schoolboy exemplified this aphorism in the highest degree when in adult years he attained distinction in medical practice as a physician and oculist. He was always the same modest, retiring, courteous personality, whether at school, college, or among his old schoolfellows in the Amersham Hall fellowship when we met for lunch, dinner, or on other occasions. Attlee was a fine example of a medical man, with painstaking accuracy and reliability such as became a first-class man in a splendid profession. His friends may take assurance in the fact that "to live in hearts we leave behind is not to die."

Dr. EDWIN JAMES WENYON, who died on February 20 at the age of 84, had practised in Dundee for thirty-six years. As a student, first in Edinburgh then in London, Dr. Wenyon had a brilliant career. His London B.A. was followed by the B.Sc. degree with honours in experimental physics; he won the science entrance scholarship to Guy's Hospital in 1878, exhibitions in 1879 and 1880, and the Sands Cox exhibition in physiology in 1880; when he qualified M.B. in 1883 he was awarded the gold medal in anatomy and gained honours in physiology. He first served as house-surgeon at Guy's Hospital, and then spent some time at the Rotunda, Dublin. After several years in the Orkneys and a short period in his native county of Staffordshire he settled finally in Dundee. Dr. Wenyon's interests were many and diverse. He was a wide reader in several languages, and a keen critic of men and events the world over. In his earlier days farming and agricultural chemistry attracted him. Riding was for many years a favourite exercise, and he "broke in" several horses for his own use; he was also a keen fisherman. In his prime he could defy any challenger at chess, and to the last remained a strong and frequent player of that game. No hobby or sport, however, roused in him such absorbing interest as did children. He waged constant war on errors of diet, whether the result of ignorance, carelessness, or poverty. Associated with a wide experience and clinical skill was a remarkable and lovable personality. His humanity and unfailing kindliness and his cheerful disposition radiated help and courage. As one of his friends has said: "To a multitude of young and old he was more than their doctor, he was their

understanding friend. In him and around him was an atmosphere of kindliness such as is found in few men." Though not above average height and build, Dr. Wenyon's intellect, versatility, and quick yet kindly wit made him a dominant person in any company. He leaves a widow and three sons and seven daughters.

The death of HENRY CHARLES ROBERTS in his forty-fourth year (writes W. G. McA.) has robbed our little corner of Cheshire, and indeed Merseyside, of one whom to know was to love. He graduated M.B., Ch.B. in 1916, and served in Mesopotamia in the great war. After practising for a short time in Liverpool he came over to Moreton, in Cheshire. He was a naturally gifted mechanic, and early became interested in anaesthetics. He designed, and at first with his own hands made, a portable gas-oxygen-ether apparatus, a modification of what he thought best in the American Foregger and Heidbrink machines. Latterly he had much improved this, and when the Cunard-White Star liner *Queen Mary* was being equipped his apparatus was installed in her. To those of us, his colleagues, who were willing to learn he freely and generously gave of his special knowledge, and made clearly plain what others seemed to have kept a mystery, and this with undoubted financial loss to himself. As anaesthetist to the Liverpool Dental Hospital I believe it is true to say that he revolutionized dental anaesthetics, and his lectures, with cinematograph films of dental anaesthesia, were becoming increasingly sought after. He was skilled in all forms of his art, including evipan, avertin, ethylene, and cyclopropane, and at the time of his passing was engaged on simplifying and making more economical the use of the last-named. He was an accomplished musician, photographer, and a keen student of Nature, delighting especially in his garden, and I shall always picture him coming to my poorly gardened house, his arms filled with flowers. His never-failing cheerfulness, generosity, and unassuming kindliness had meant so much that his unexpected death has caused consternation to his professional colleagues, friends, and patients, and among these latter the poor, who worshipped him. He leaves a widow and one son.

We regret to announce the death at sea, on March 11, of Dr. JOHN MCDONALD, who until his retirement practised for many years at Barking, Essex. He was born at Wishaw, Lanarkshire, on July 4, 1869, and from St. John's Grammar School, Hamilton, went to study medicine at Anderson's College and the University of Glasgow, graduating M.A. in 1888 and M.B., C.M. with high commendation in 1892. Before settling in practice he was for a year assistant house-physician at the General Hospital, Nottingham. Dr. McDonald was appointed public vaccinator for the Barking district by the Romford Board of Guardians in 1902, and became certifying factory surgeon in 1906. He joined the British Medical Association in 1911 and was chairman of the Stratford Division in 1928–9.

With the death on March 14, at his residence in Teddington, of Dr. FREDERICK WILLIAM ALEXANDER, O.B.E., there has passed one of the health pioneers in the East of London whose services latterly to the blind were almost equally notable. Born in Hatton Garden in 1859 he attended University College School and then went on as a medical student to St. Bartholomew's Hospital. He qualified M.R.C.S.Eng. in 1881, and obtained the diploma L.R.C.P.Ed. two years afterwards. In 1887 he became D.P.H. of the English Conjoint Board. He held the post of deputy medical officer of the Croydon Union Infirmary contagious wards from 1881 to 1883, and then became a ship surgeon on the Dunkeld Currie Line. He was resident assistant medical officer of the Mile End Old Town Infirmary in 1884–6, district medical officer and public vaccinator of the west district of Mile End Old Town from 1886 to 1893, and then medical officer of health for Poplar until 1926. In these capacities Dr. Alexander brought into being many reforms in the sphere of public health, being prominently associated with the chemical and electrolytic methods of purifying the water of swimming baths. He published reports on the cause of diphtheria, the disinfection of houses, the management of children, artificial light treatment, the cause and prevention of malignant diseases, and the nature of vitamins. When he retired from his appointment in Poplar he championed the cause of the blind in the same practical way, devising an ingenious method whereby Braille reading couid be more easily acquired by those who had lost their sight owing to accident or disease. His leisure was mainly devoted to this and other ways of making life happier for the blind.

I note with deep concern (writes Sir Ernest Graham-Little) the announcement in your issue of March 20 of the death of Lieut.-Colonel J. R. FORREST, R.A.M.C. I first came into touch with him in the later years of his life, when he decided to enter for the final medical examinations of London University, sixteen years after he had retired from a long and distinguished service in the R.A.M.C. He took his M.B., B.S.Lond. in 1927, when he was 71 years of age, and the M.D. at the age of 75, surely a remarkable achievement worthy of notice. After surmounting his final degree examination he wrote to me intimating his desire to serve the University in any capacity open to him, and the General Purposes Committee took advantage of this offer and appointed him as a representative of the University on certain bodies in his own neighbourhood. He was a constant attendant at meetings of Convocation up to a quite recent date. It was a particular pride and pleasure to me that he gave me his vote in the Parliamentary elections of 1929, 1931, and 1935, and I am glad to offer this tribute of gratitude to him and of regret for his loss.

We regret to announce the death of Dr. THOMAS GRIMSON of Boscombe, at the early age of 45, on March 8. Dr. Grimson graduated M.B., B.Ch., B.A.O., at Queen's University, Belfast, in June, 1914, and on the outbreak of the war joined up with the Ulster Division. He saw service in France, and two years later transferred to the Royal Navy, where he held the rank of surgeon lieutenant till the end of the war. After this he practised for a short period at Earlsfield. But it was Finchley where he spent the greater part of his professional life, and by his skill and winning personality built up a successful practice. Three and a half years ago he left Finchley for Parkstone, and only last August began practice afresh at Boscombe. His popularity was demonstrated by the large number of former patients who attended the funeral at Finchley on March 12. This was preceded by a service on the previous day in St. George's Methodist Church, Boscombe, conducted by the Rev. James Mackay. Among the large congregation attending this service was Dr. Watson Smith, vice-president of the British Medical Association. Dr. Grimson leaves a widow and a son and daughter, who have the sympathy of all his colleagues.

The Services

The King has conferred the Efficiency Decoration of the Territorial Army on Lieut.-Colonels William Lawson Mabson Gabriel and Kenneth Pretty, R.A.M.C.(T.A.), and Major and Brevet Lieut.-Colonel George Whittaker, R.A.M.C.(T.A.).

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers to the Naval Medical Compassionate Fund will be held on April 16, at 3 p.m., at the Medical Department of the Navy, Admiralty, S.W.1, to elect six directors of the Fund.

Universities and Colleges

UNIVERSITY OF LONDON

APPOINTMENT OF PRINCIPAL

The Senate, with the concurrence of the Court, has appointed Mr. Herbert Lightfoot Eason, C.B., C.M.G., M.D., M.S., F.R.C.S., to the post of Principal of the University from July 1, 1937, to September 30, 1941.

Mr. Eason was educated at University College, London, and at Guy's Hospital. He took his M.D. degree in 1901 and his M.S. in 1902. He has been superintendent of Guy's Hospital since 1920, having previously held the post of dean of the Medical School from 1904 to 1912. He has been a member of the Senate since 1911, and has been Vice-Chancellor since 1935. He was chairman of the Library Committee from 1929 to 1933, chairman of the Finance Committee from 1923 to 1925, and chairman of the Academic Council for two periods (1922 and 1933). He served during the war as consulting ophthalmic surgeon to the Forces in the Mediterranean, Egypt, and Palestine, was mentioned in dispatches, and was awarded the G.M.C. in 1917 and the C.B. in 1919. He has been the representative of the University on the General Medical Council since 1925 and is now Junior Treasurer of the Council. From 1924 to 1926 he was a member of the Departmental Committee of the Board of Education on the reconstitution of the University of London, and from 1925 to 1930 a member of the Departmental Committee of the Ministry of Health on Post-graduate Medical Education.

At a meeting of the Senate, held on March 17, with the Vice-Chancellor, Mr. H. L. Eason, in the chair, a message was received from the Chancellor, the Earl of Athlone, that the Queen had been graciously pleased to signify her consent to receiving an honorary degree from the University of London. The conferment of the degree will probably take place in the autumn.

The degree of D.Sc. in Bacteriology was conferred on Miss M. S. Lacey of Birkbeck College.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

Entrance Scholarships and Exhibitions

Two Goldsmid Entrance Scholarships, entitling the holder to the final course of medical study, are offered for competition in July, and are open to students who are preparing for the degrees of the Universities of London, Oxford, Cambridge, Durham, or other British universities, or for the diplomas of the Royal Colleges of Physicians and Surgeons; also one Goldsmid Entrance Exhibition, entitling the holder to a reduction by £80 of the fees due for the full course of final medical study; and the Filliter Entrance Scholarship in Pathology, entitling the holder to a reduction by £52 10s. of the fees due for the full course of final medical study. These scholarships and exhibition are tenable at University College Hospital Medical School. Full particulars may be obtained from the secretary, University College Hospital Medical School, University Street, W.C.1.

UNIVERSITY COLLEGE

The holders of the Bucknill Scholarship (value 160 guineas), tenable at University College for the intermediate medical studies, and for the final course at University College Hospital Medical School, are not eligible for the above awards. The subjects of the examination are chemistry, physics, botany, and zoology, and further particulars of this award may be obtained on application to the secretary, University College, Gower Street, W.C.1.

UNIVERSITY OF LEEDS

Dr. W. MacAdam, F.R.C.P., formerly professor of clinical medicine, has been elected to the chair of medicine in place of Dr. G. W. Watson, F.R.C.P., and Dr. J. le F. C. Burrow, F.R.C.P., formerly professor of pharmacology and therapeutics, has been elected to the chair of clinical medicine. To the vacancy caused by these changes the Council has elected Dr. S. J. Hartfall, M.R.C.P., with the title of professor of therapeutics and applied pharmacology.

At a meeting of the University Council, held on March 17, Miss M. Hilary E. Long, F.R.C.S., was elected to the newly instituted readership in surgery, and Dr. J. C. Coates was appointed demonstrator in anatomy.

UNIVERSITY OF DUBLIN

It is proposed to confer on June 30 the honorary degree of Doctor of Science on Professor J. S. B. Stopford, M.D., F.R.S., Vice-Chancellor of the University of Manchester.

Medical Notes in Parliament

The Public Health (Drainage of Trade Premises) Bill passed through committee in the House of Lords on March 16 and was set down for second reading on March 22. The Deaf Children (School Attendance) Bill was read a second time in the House of Lords on March 18. On March 19 the Royal Assent was given to the Regency Act, the Geneva Covenant Act, and the Evesham and Pershore Joint Hospital District Act.

Before adjourning for the Easter Recess the House of Commons this week discussed the Air Estimates, the floods in the Fens, and the import duty on steel. When Mr. Baldwin moved and the House agreed, on March 17, that a Select Committee of the House of Commons be set up to consider the Civil List, Sir Arnold Wilson asked whether the committee would be free to consider the adequacy of "Civil List" pensions although these were not actually borne on the Civil List. The annual new money provided in these for persons who had made useful discoveries in science or performed other duties to the public had not changed since 1837. Mr. Baldwin said the Government had no objection to this matter going before the Select Committee.

Dr. Kurt Hahn of Gordonstown School, Elgin, who previously established Salem School on Lake Constance, addressed the Health and Housing Committee of Conservative Members at the House of Commons on March 17. He said it was found that boys in other schools were over-exercised and their hearts sometimes damaged. Each boy's efficiency should always be tested first, and physical training was useless except under proper health supervision. Three medical examinations a term were needed, and the institution of a badge for proficiency in jumping, running, and throwing was invaluable. Crack athletes produced on the ordinary system were usually failures in patience and in enterprise. Sir Francis Fremantle presided.

The House of Commons will reassemble on April 6 and the Budget will be opened on April 20.

Factories Bill in Committee

When the Standing Committee of the House of Commons which is examining the Factories Bill resumed on March 16 Clause 15 (provisions as to unfenced machinery) and Clause 16 (construction and maintenance of fencing) were agreed to. Amendments were made to Clause 17 (new machinery), and the clause was added to the Bill.

On Clause 18 (vessels containing dangerous liquids) Mr. GRAHAM WHITE moved to add a provision that every vessel, sump, or pit covered by this section should have affixed to it a notice indicating the nature of its contents. Mr. BROAD pointed out that the clause only dealt with fixed vessels. More accidents occurred with the use of portable vessels of earthenware or of lead, and from the huge carboys in which acid was stored. Mr. BANFIELD said that in Birmingham he had seen these portable vessels treated in an irresponsible way, and carried through the streets on all sorts of vehicles. Sir JOHN SIMON said that it was possible under Clause 58 to make a regulation directing that carboys containing dangerous things should not be left lying about, but be put in proper places. The committee agreed to the clause, and also to Clause 19 (self-acting machines).

ACCIDENTS FROM MOVING MACHINERY

On Clause 20 (cleaning of machinery by women and young persons) Mr. MANDER moved an amendment which provided that instead of the prohibition against the cleaning of prime movers or transmission machinery in motion applying only to women and young persons it would apply against all persons.

Mr. SHORT said the Labour Opposition was not satisfied with the clause as it was drafted, and hoped the Home Secretary would accept Mr. Mander's amendment. Accidents among young persons had greatly increased. The Chief Inspector of Factories and Workshops had called attention to this matter. In 1935 there were 25,042 accidents among young persons, or 3,130 accidents per 100,000 young persons employed, as compared with 2,542 accidents per 100,000 employed among adults.

Sir JOHN SIMON said he could not accept the suggestion that nobody—man, woman, or young person—should clean any part of a prime mover or transmission machinery while it was in motion. How were engines to be cleaned in a power station, where they never stopped? Statistics showed that both women and young persons, if they cleaned machinery, were subjected proportionately to far more accidents than other people, whether in textile factories or non-textile factories.

Miss HORSBURGH asked whether statistics for accidents to women and young persons were kept separately.

Sir JOHN SIMON said the figures had been taken out separately. Women probably did more cleaning than men, but the age of women in factories was on the average lower than that of men. They were people short of experience, and might sometimes be a little casual. In the cotton industry cleaning accidents to men were 45.6 per 100,000, and cleaning accidents to women 101.7 per 100,000. The cleaning accidents to young persons were 166.8 per 100,000.

Mr. Mander withdrew his amendment, and the clause was added to the Bill.

SAFETY DEVICES ON LIFTS

A discussion followed on Clause 21 (hoists and lifts). Mr. BROOKE moved to omit certain words, and explained that the effect of the omission would be to enforce the provision on every hoist or lift of a device automatically fastening the gateway. Mr. GEOFFREY LLOYD said the only provision in the existing law was that lifts and hoists should be securely fenced. The clause would involve considerable expense to occupiers, but there was no general opposition to it. It was not true that all existing hoists could easily be adapted with the device of interlocking gates. All that the clauses provided was that these interlocking devices should not be obligatory on existing hoists, where the difficulties would be great. The amendment was defeated by 20 to 18, and the committee adjourned until March 18.

On resumption the committee accepted an amendment to Clause 21, which was moved by Sir JOHN SIMON, and dealt with the provision of safety gates to lifts. Other amendments were made, and the clause was added to the Bill. Sir John Simon explained that lattice gates to lifts were not to be prohibited, although it was desirable that the interstices should not be so wide as to catch a man's foot or heel. They could not prevent the small extremities running a little risk.

OTHER SAFETY CLAUSES

Clause 22 (chains, ropes, and lifting tackle), Clause 23 (cranes and other lifting machines), and Clause 24 (construction and maintenance of passages and stairs) were added to the Bill. To the last clause the committee added, on the motion of Sir John Simon, a proviso that any open side of a staircase shall also be guarded by the provision and maintenance of a lower rail or other effective means. Clause 25 (safe means of access and safe place of employment) was approved with modification reducing from 12 to 10 feet the height of working places which must be secured by fencing, unless they afford secure foothold and handhold.

On Clause 26 (precautions in places where dangerous fumes are liable to be present) Mr. GEOFFREY LLOYD promised before the report stage to investigate the objection made by Mr. Silkin, Mr. Frankel, and Mr. Gibbins that the safeguards proposed were insufficient. These members object in particular that where a man was working thirty or forty feet away from a manhole and might create fumes by his work—as, for instance, by using an oxy-acetylene burner—the provision of a belt and a rope, the free end of which was held by a person outside, was not sufficient safeguard. Mr. GIBBINS said that when men were working below the boilers or engines of a ship all day without gas masks their chests became affected from the fumes. On Mr. Lloyd's undertaking, the clause with certain amendments was ordered to stand part of the Bill.

On Clause 27 (precautions with respect to explosive or inflammable dust, gas, vapour, or substance) an amendment was accepted in the name of Mr. Graham White providing that the Chief Inspector could grant exemption from compliance with any of the requirements of the subsection when satisfied such compliance was unnecessary or impracticable, and also that the subsection should not apply to plant installed in the open air. He explained that this particularly applied to work upon gas-holes. The committee then agreed to the clause. Subsequent clauses dealing with steam boilers, steam receivers, steam containers, and air receivers were added to the Bill, as was also Clause 32, dealing with water-sealed gasholders. A discussion followed on Clause 33 (means of escape in case of fire), which, together with Clause 34 (regulations and by-laws as to means of escape in case of fire), Clause 35 (safety provisions in case of fire), and Clause 36 (instruction as to use of means of escape in case of fire), were added to the Bill.

A discussion on Clause 37 (power of the Secretary of State to require special provision in cases of special danger) was begun, and the committee adjourned until March 23.

Army Life to be Improved

Introducing the Army Estimates on March 16 Mr. DUFF COOPER said reforms would be made in Army life which would increase the popularity of the service. The soldier's ration was to be increased to allow of four meals a day instead of three. At home stations an ounce of butter would be substituted for an ounce of margarine, and the butter would be supplemented by half an ounce of irradiated margarine. The daily ration of enlisted boys would be increased by an issue of milk or in other suitable ways. It had also been arranged that men living in married quarters or unable for other reasons to feed in mess should receive a sufficient allowance of food or money to ensure that they would enjoy the same scale of nourishment as their fellow soldiers. Every effort was being made to improve the conditions of accommodation. New barracks would include sleeping, dining, and ablution facilities. Sitting-rooms would be provided, hot and cold water laid on to every floor, central heating throughout, and arrangements were being made for increases in fuel scales. So far as possible similar amenities were being extended to existing barracks, and married quarters were being brought up to the best housing standards of the day.

Research on Influenza

In a reply to Mr. Lees-Jones on March 18 Mr. RAMSAY MACDONALD said research on influenza and the common cold had been assisted by the Medical Research Council from time to time. In particular, the investigations into influenza now being made by the Council's own staff at the National Institute for Medical Research had been in progress since 1933. During the past year there had been further confirmation from different parts of the world that the virus originally isolated at the National Institute for Medical Research in 1933 was the infective agent which caused epidemic influenza. On this basis attempts to devise preventive measures continued. Substantial progress had been achieved by these scientists working in the service of the British Government, and there was considerable ground for hoping that a satisfactory means of producing at least temporary immunity would be evolved. Earlier methods of inoculation against influenza had been unsatisfactory, because they were not based on the accurate knowledge now believed to be available regarding the nature of the causative agent. The Council was not at the moment supporting any direct attack upon the common cold, but the

problems were closely related, and an advance against the one disease was likely to assist attack on the other. A statement which had been made in the Press to the effect that the Council had as a matter of policy abandoned work on the common cold was without foundation. It was not possible to state the cost of this investigation separately from that of other work involving the same personnel and equipment.

Birching of Juveniles: Committee of Inquiry

Sir JOHN SIMON said on March 18 that there were 164 cases of birching ordered in juvenile courts in 1936 and 218 cases in 1935. The practice of different juvenile courts differed, and he had decided to appoint a small Departmental Committee to consider the whole matter.

Capitation Fee Tribunal

On March 22 Mr. RHYS DAVIES asked the Minister of Health whether he was in a position to state the personnel and terms of reference of the tribunal to be set up to inquire and report on the capitation fee to panel practitioners under the national health insurance scheme. Sir KINGSLEY WOOD replied that he was in communication with the British Medical Association on these matters, but was not yet in a position to give the information desired.

Typhoid Fever Outbreak at Liverpool.—Sir KINGSLEY WOOD on March 17 assented to a statement that the milk supply obtained from the same retailer by some 60 per cent. of the persons affected in the recent outbreak of typhoid fever at Liverpool was pasteurized milk. He added that there was no reason to believe that milk was the source of infection in these cases.

Sale of Spectacles.—Sir KINGSLEY WOOD on March 18 told Mr. Robert Taylor that he had no direct evidence of damage caused by wearing of spectacles sold by certain stores and by pedlars with no qualifications as opticians, and had no power to prohibit their sale. So far as insured persons are concerned it was proposed to make regulations that spectacles provided by way of additional benefit could only be obtained from opticians recognized by a committee to be set up under the regulations.

Death following Vaccination.—Sir KINGSLEY WOOD stated on March 18 that he had made inquiries into the death of a man at Manor Park which was attributed by the Ilford coroner to the effects of vaccination. The lymph used was obtained from a commercial firm, and rabbits were not used in connexion with its manufacture. He had no information on the allegation that the young man's employers made vaccination a condition of employment.

Filter Material in Gas Masks.—Mr. GEOFFREY LLOYD told Mr. Creech Jones on March 19 that the material employed as a filter for smokes in the gas masks being made at Blackburn for distribution to the civilian population consisted of a mixture of wool and asbestos. Extensive tests with toxic smokes had proved that the respirator would afford protection against all such poison gases under the conditions which would arise in practice.

Transfusion of Corpse Blood.—Sir KINGSLEY WOOD, replying on March 22 to Mr. M. Samuel, said that he had no information of experiments in the transfusion of blood from the dead in this country. No legislation to limit transfusions to those from living persons who willingly offered their own blood was called for.

Extension of Contributory Pensions Scheme.—In the House of Commons on March 22 Sir KINGSLEY WOOD presented the Widows', Orphans', and Old Age Contributory Pensions (Voluntary Contributors) Bill. The measure extends the classes of persons who can become insured as voluntary contributors for the purposes of widows', orphans', and old age contributory pensions, and amends, in relation to voluntary contributors and women engaged in certain excepted employments the enactments relating to such pensions and health insurance.

Medical News

A Chadwick Public Lecture on "The Plan and Equipment of Kitchen Offices in Hospitals and other Institutions" will be delivered by Miss R. Whitaker at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., on Thursday, April 15, at 5.30 p.m.

As part of the first national appeal of the People's League of Health a festival banquet will be held at the Guildhall, London, on Thursday, April 15, at 7.45 p.m. The Lord Mayor will preside, attended by the Sheriffs of the City of London.

A meeting of the Cambridge Medical Society will be held at Addenbrooke's Hospital on Friday, April 2, at 2.30 p.m., when a discussion on "Joints from the Medical Point of View" will be opened by Dr. J. F. Gaskell and Dr. W. H. Bradley. Members of the Cambridge and Huntingdon Branch of the British Medical Association are entitled to attend the meetings of the society.

The Swiss Society for Internal Medicine will hold its annual meeting at Geneva on June 5 and 6, when the chief subjects for discussion will be angina pectoris and its treatment, introduced by W. Frey of Berne, and hypochloraemia, introduced by R. Mach of Geneva. Further particulars can be obtained from Professor G. Bickel, 2, Rue Saint-Legier, Geneva.

The German Society for Historical and Social Medicine will hold its twenty-sixth congress at Breslau from May 12 to 14, the subject for discussion being the present state of our knowledge on electropathology. Further information can be obtained from Professor Schrader, Lahnstr. 9, Marburg a.d. Lahn, Germany.

An international congress on haematology, organized by the German Haematological Society, will be held first at Münster and then at Bad Pyrmont, Germany, from May 8 to 14. Further information can be obtained from the general secretary, Dr. Rosegger, Med. Universitäts Klinik, Westring 2, Münster, Westphalia.

The fifth International Hospital Congress will be held in Paris from July 5 to 11 inclusive. Among the items on the programme are a lecture by Professor Roussy, Paris, on "The Care of the Cancer Patient in the Hospital"; a discussion at the plenary session, on July 7, on "How Can the Hospital Increase its Income and Reduce its Expenditure without Detriment to its Work?"; a discussion, on July 9, on "The Methodical Organization of Hospital Services," one of the speakers being Mr. H. L. Eason, vice-chancellor of the University of London; and a discussion, on July 10, on "The Rights of the Hospital in Regard to Documents Drawn up for the Service of the Patient (films, graphs, etc.)." Full particulars of the congress and of the study tours and sight-seeing arranged in connexion with it may be obtained from the general secretary and treasurer, International Hospital Association, 87, Lord Street, Liverpool.

The result of the Parliamentary by-election in the combined English Universities constituency, caused by the death of Sir Reginald Craddock, was declared at Birmingham on March 22. Mr. T. E. Harvey, formerly a Liberal M.P. and standing now as an Independent Progressive, polled 6,596 votes; Sir Francis Lindley (Conservative), 4,952; and Sir Henry Brackenbury (Independent), 2,373.

On the afternoon of March 18 members of the University of London Medical Graduates' Society paid a visit to the Charterhouse and the Medical College of St. Bartholomew's Hospital in Charterhouse Square, where they were received by Mr. W. Girling Ball, F.R.C.S., dean of the Faculty of Medicine of the University and dean of St. Bartholomew's Medical College.

The prize for the essay on the "Significance of Heredity in Ophthalmology," sent in for the Gifford Edmonds Prize, has been awarded to J. Bruce Hamilton, M.B., Ch.M. Sydney, D.O.M.S.Lond., D.O.Oxon, F.R.A.C.S., of Hobart, Tasmania.

A gold medal is awarded annually by the Hunterian Society for the best essay written by a registered general practitioner resident within the British Empire on a subject set by the society. The subject for 1937 is "The Prognosis and Care of Heart Disease in General Practice," and for 1938, "The Management of Inoperable Malignant Disease in General Practice." Candidates should obtain a copy of the rules governing the competition from the honorary secretary, Mr. Arthur Porritt, 27, Harley Street, W.1, before sending in their essays, which must reach him by December 31. The gold medal for 1936 was awarded to Dr. L. J. A. Parr of Sydney, Australia, for his essay on "Rheumatoid Arthritis."

In the autumn of 1935 Lord Nuffield offered to give to Papworth Village Settlement a sum of £25,000 when the settlement had itself raised £75,000. Papworth has now managed to raise £60,000 of the total needed, and on Tuesday, April 20, at Grosvenor House, the Duke of Kent will preside over a festival dinner, by means of which it is hoped to raise the final sum needed to render Lord Nuffield's offer effective. A film will be shown, and dancing and a first-class cabaret will follow the dinner. Tickets may be had from Papworth's new London offices at 16, Grosvenor Place, S.W.1.

The annual dinner of the Medical Superintendents' Society was held at the Langham Hotel on March 20, with the president, Dr. John D'Ewart, in the chair. The toast of "The Society" was proposed in a brief speech by Sir Cuthbert Wallace, who remarked that his medical life corresponded with that of the society. Referring to the development of hospitals during this period, he said that in his student days the steward ruled the hospital. In these days hospital life was so complex that the existence of such a society as the Medical Superintendents' was essential. Maintaining the excellent standard of brevity that had been set by Sir Cuthbert, Dr. D'Ewart, in reply, recalled some of his early experiences in hospital life, and said that he remembered the installation of the first *x*-ray plant and of the first pathological department in the hospital at which he worked. The medical superintendent, he said, was a co-ordinating power, and the society showed signs of great activity. The health of the guests was proposed in a witty speech by Dr. W. A. Ramsay, who, with appropriate annotation, welcomed the presence of Sir Cuthbert Wallace, Dr. Adolphe Abrahams, Dr. Ernest Ward, Mr. G. A. Elliston, representatives from the *Lancet* and the *British Medical Journal*, Dr. Mackintosh, and Dr. H. P. Newsholme. Replying for the guests, Dr. Abrahams gave a short dissertation on the custom of after-dinner speaking, remarking that man was the only animal which indulged in this—other animals lay down and went to sleep. Speaking not only as a guest but also as a representative of the voluntary hospital, he said that the time would surely come when all the resources of the voluntary and municipal hospitals must be pooled. Dr. Ernest Ward, who sustained the level of wit with ornithological anecdotes, also replied for the guests.

Miss Ada Blanche Marshall, daughter of the late Professor John Marshall, F.R.C.S., left estate valued at more than £32,000. Among other bequests she gave £2,000 to Epsom College, half to be applied towards the cost of pensioners and half towards the cost of foundation scholars, in memory of her father. The bulk of the residue of her estate is bequeathed to the University of London, to be applied for the advancement of surgery in the name of her father.

The Meteorological Office has issued two pamphlets: (1) "Averages of Bright Sunshine for the British Isles for Periods ending 1935," and (2) "Averages of Temperature for the British Isles for Periods ending 1935." The former has 43 pages, and conforms to the same principle as a previous report noticed in this *Journal* on January 26, 1935, p. 158. The latter—52 pages—has two tables: (i) showing monthly and annual averages of mean maximum, mean minimum, and mean temperature; (ii) showing monthly and annual averages of temperature at fixed hours. These are followed by a list of 294 stations from which observations were recorded. This list serves as a useful index. The reports should prove a valuable guide to doctors who have to advise convalescent patients. They are published at 1s. and 1s. 3d. respectively (postage extra), and can be obtained from H.M. Stationery Office or through any bookseller.

The French Minister of Public Health has issued an order to the effect that artificially irradiated foods may be sold only by chemists. This is a sequel to the denunciation last December, at a meeting of the Academy of Medicine, of the therapeutically indiscriminate sale of allegedly irradiated foods over the counters of grocers' shops.

Colonel Charles Leonard Isaac, T.D., senior surgeon to the Swansea Hospital, has been appointed a deputy lieutenant for the County of Glamorgan.

In 1935 there were 73,101 cases of typhus and 2,002 of small-pox in Soviet Russia. In the same year no cases of typhus, cholera, yellow fever, or plague were notified in Germany.

Letters, Notes and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
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QUERIES AND ANSWERS

External Use of Iodine

"NEST" writes: This hardy plant flourishes. A few years ago in your correspondence columns I quoted examples of "erysipelas" seen in my school clinics arising from ambulant iodine, the tincture usually suffering from decomposition of age, with the production of iodate. For over twenty years I have forbidden its use in my own ambulance classes, but it continues to be stock teaching. As to friar's balsam for cuts of the nose, lips, and especially the ears, etc., this has been the stand-by of my first-aid pupils for more than forty years. The important matter, however, in abrasions is surely to effect quick cleansing with trustworthy material, which is also commonly available. For this purpose—and neither iodine nor friar's balsam can fulfil either of these conditions—I know of nothing better than petrol. I use two swabs, one on the wound, the other wiping vigorously the skin beyond. The wound swab cleanses and keeps the patient's view "submerged." The youngest infant never makes a sound, facial wounds as others being peacefully dealt with. In the pamphlet issued by the Automobile

Association, forwarded with my driver's licence, it amused me to note the recommendation of iodine for motoring abrasions.

Sleep Rolling

"J. M. C." (Africa) writes: Our son, aged 9 years 6 months, has had the habit of rolling from side to side in his sleep from his early cot days. This rolling may take up so much of the night that he is obviously tired and listless next day and unable to do his school work well. The rolling often begins with a sudden start, as if he were dreaming, but at other times just comes on in the course of his sleep. So far as I know he is always asleep when he is rolling, though he makes various noises, grunting, sighing, etc. I fear he used to be rocked rather vigorously as a baby. The only attempts to cure him have been by modifications of his evening meal, and suggestions to him that the rocking is a baby trick, which he should try to stop. Any helpful suggestions from readers would be gratefully appreciated.

Income Tax

Voluntary Dispositions for Children

"D. J." asks for a reference to notes in previous issues with regard to reduction of total liability for tax by means of the above.

*** Notes on the point appeared in the issues of October 19, 1935 (p. 731) and January 25, 1936 (p. 194). The effect of the Finance Act, 1936, however, is to invalidate such dispositions as regards income tax except where the "child" in question is under 21 years of age.

Temporary Residence in the United Kingdom

"M.R.C.S." is a Government official at present on study leave, and inquires as to the conditions of liability to United Kingdom income tax.

*** As the residence here is for a temporary purpose "M.R.C.S." will not be liable unless he is in the United Kingdom for six months of any one financial year—that is, reckoning the year to end on April 5. On becoming liable in that way he will be chargeable to tax on the amount of the salary remitted to him here. If, on the other hand, he maintains a residence here—for example, for the use of his wife—*he* becomes a resident on his arrival in the country, and the six months period is not required to create liability. The question is a complicated one and the Board of Inland Revenue has prepared a brief statement on the point for the information of persons visiting this country; we suggest that "M.R.C.S." might write to Somerset House for a print of that memorandum.

LETTERS, NOTES, ETC.

Ampoules of Sterile Sodium Chloride

The CHIEF CHEMIST of British Colloids Ltd. (The Crookes Laboratories, London, N.W.10) writes: In the article by Hamilton Bailey, W. I. B. Stringer, and K. D. Keele, published in the *Journal* of March 13 (p. 552), the statement is made that it would be an advantage to have ampoules of sterile sodium chloride for the rapid manufacture of safe solutions for infusion. May we point out that such ampoules, manufactured by ourselves, have been in existence for some years. With the aid of one of these ampoules containing 50 c.cm. of solution (in the case of gum saline 100 c.cm.) one pint of infusion solution of normal glucose, normal glucose in saline, normal saline, hypertonic saline, Ringer's solution, or gum saline can be made up instantly.

"Constitutional Therapy"

Dr. THOMAS B. L. BRYAN (London, S.W.1) writes: As Dr. Robert Hutchison and the leading article in your issue of January 9 point out, modern medicine is being built upon a constitutional basis. It is therefore timely to seek a system of drug therapy built upon this constitutional foundation. The constitution of an organism governs its response to stimuli. Thus by the responses of an organism to stimuli its constitution at the time of reaction may be estimated. As an expansion of Arndt's generalization, it may be stated that to a given stimulus an organism reacts differently according to the dosage of the stimulus—small doses encourage life activity, large doses impede life activity, very large doses destroy life activity. Thus the life of an organism is maintained, and its constitution strengthened, by the constant reception of stimuli in small beneficial doses—for example, mental exercise, food, heat, light, mild bacterial inoculations, etc. Large doses of stimuli cause disease. The actual symptom-complex produced in an organism by any disease stimulus at any given time depends upon the constitution of the organism at that time. Hence preventive medicine aims at reducing the number of disease stimuli to a minimum and building up the constitution of the organism to the maximum, curative medicine at removing the harmful stimulus, strengthening the constitution by rest, food, warmth, supply of deficiencies—for example, insulin, haemopoietic factors, etc.—passive immunity, etc., and encouraging the organism to mobilize all the forces of resistance which the constitution has at its command. This last object may be achieved by means of a constitutional drug, or sometimes by the use of a vaccine. During an illness the constitution is under a strain, and a further stimulus must be given with care; hence the caution in using vaccine therapy in active disease. Now the syndrome present is the only picture which we have expressing the constitution of the organism at that time. If a drug is known which, when given in large doses, will produce this identical syndrome, it has been found that it will act as a very beneficial stimulus if administered in an appropriate dose to the diseased organism. This system of drug therapy, which is indeed a true "constitutional therapy," has been, and is being, used very successfully by thousands of practitioners throughout the world. It is not used, of course, to the exclusion of the other forms of therapy, but in sound conjunction with them.

Colorimetric Tests for Oxidation-reduction

The B.D.H. Analytical Laboratories have found it necessary to publish a second edition of their monograph *The Colorimetric Determination of Oxidation-Reduction Balance*. This revised edition provides a theoretical outline of the subject, explains the use of indicators in measuring oxidation-reduction potentials, and refers to the use of oxidation-reduction determinations in biochemical work, milk testing—as, for example, in the Ministry of Health's methylene-blue test—sewage control, organic chemical analysis, vitamin determinations, metallurgy, etc. A copy will be sent to readers free of charge on application to British Drug Houses Analytical Laboratories, Graham Street, London, N.1.

A Curative Shock

An account is given in the lay press of a Sydney doctor who had a dislocation of the cervical vertebrae as a result of a violent impact with another man whilst bathing. Before the *x*-ray film showing his condition was developed the doctor in question received in the *x*-ray department a violent electric shock which threw him across the room. A subsequent *x*-ray examination showed that the second accident had reduced the dislocation.

Society of Public Analysts and Other Analytical Chemists

Mr. A. L. BACHARACH, M.A., F.I.C., writes: On page 631 of your issue of March 20 you report a lecture given by Professor G. Barger to the Society of Public Analysts and Other Analytical Chemists. I have been a member of this society for many years, and am at present one of its vice-presidents, but I write to you entirely in my private capacity. Seeing that the membership of the society includes about 100 to 150 analysts who are either themselves public analysts or working in the laboratories of public analysts, and over 600 other analytical chemists, it seems to me a little unfortunate that its title should be abbreviated as it has been in your report of this lecture. The society represents the scientific interests of all analytical chemists, and the misleading impression given by shortening its name is particularly paradoxical when it appears in the report of a lecture that was not given by a public analyst and has nothing to do with the work of public analysts. The lecture was, however, of the very highest interest to all of those concerned with analytical chemistry, and it is on that basis that the society's membership exists and expands.

Wax Solvents

Dr. J. SANDISON CRABBE (Birmingham) writes: If Dr. G. C. Pether will try the following solution as ear drops for two days he will be able to empty an ear with one syringeful of warm water. Sod. bicarb., gr. xx, glycerin ʒi, aq. ad ʒi. Use three times a day.

We are asked to mention that Stericrepe bandages, of which a notice appeared in the *Journal* of March 13 (p. 560) are made by the Stericrepe Corporation, Victoria House, Southampton Row, W.C.1.